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ENVIRONMENTAL ANALYSIS

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MONTANA ENVIRONMENTAL ANALYSIS HANDBOOK

montana state office

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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POLICY

"An Environmental Analysis is done on all actions proposed by the Bureau of Land Management or requested under its jurisdictions. The purpose of the analysis is to insure that the environmental consequences of the action, and public response to these consequences, are fully set forth before the agency official responsible for the decision. This is a major step in insuring that public lands resources are used wisely and contribute to productive, healthful, and satisfying environment - a major objective of the National Environmental Policy Act of 1969."

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MONTANA ENVIRONMENTAL ANALYSIS HANDBOOK

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SECTION 1

EA POLICY AND PROCEDURES

SECTION 1

ENVIRONMENTAL ANALYSIS POLICY AND PROCEDURES

1.1 AUTHORITY AND RESPONSIBILITY FOR ENVIRONMENTAL ANALYSIS

The authorities for environmental protection and enhancement are listed in BLM Manual 1790 and include: 18 statutes, 4 Executive Orders, and 5 other compliance documents. The responsibilities for meeting the objectives stated in Bureau Manuals 1790-1793 are outlined below.

State Office Division of Resources

The State Office Division of Resources has responsibility for guidance and monitoring of the resource programs for which environmental analysis is required. In preparing and consolidating the Annual Work Plan, the Division of Resources, in communication with the Districts, identifies those programs which will require major environmental analysis during the year. The Division of Resources advises the Division of Planning and Environmental Coordination of these needs, and they jointly arrange with the District for any State Office technical assistance.

District Managers

The District Manager is responsible for the scheduling, preparation, and technical adequacy of environmental analysis documents. It is the responsibility of the District Manager or designated official to contact the Branch of Environmental Coordination with questions or concerns over EA procedures or to obtain prearranged support, identified in the AWP, for preparation of environmental analysis.

It is the responsibility of the DM to contact the SO Division of Resources when the environmental analysis results have implications on program direction or decisions within the state. The DM and SO Division of Resources are responsible for the coordination of efforts to insure that the program decisions relating to actions covered in environmental analysis are consistent with program direction.

Division of Planning and Environmental Coordination

The Branch of Environmental Coordination is responsible for reviews of Environmental Analysis documents submitted to the State Office by the Districts. Two different types of reviews will be made:

1) Review of technical and procedural adequacy under NEPA--responsibility of Branch of Environmental Coordination
2) Review of adequacy of the EAR from the program standpoint--responsibility of Division of Resources or Division of Technical Services.

The Branch of Environmental Coordination is responsible for coordinating the reviews and consolidating the comments on EISs prepared by other agencies. If the proposed action in the statement would significantly impact Bureau programs, then State Office Divisions and appropriate District Offices will be requested to make a timely review of the document and submit their comments to the Branch of Environmental Coordination.

Printing of major EARs is coordinated through the Division of Planning and Environmental Coordination.

The guidance provided in this handbook is supplemental to BLM Manuals 1790 through 1793 and has been produced in a looseleaf format to facilitate updating. Sections will be revised or replaced in response to changes in Federal laws and policies or as the result of suggestions for improvements in environmental analysis methods that result from use of this guidance.

This handbook on environmental analysis is directed towards the preparation of Environmental Analysis Records (EARs) and Environmental Impact Statements (EISs). Most of the detailed material is intended for District use in developing specific, complex, interdisciplinary EARs and EISs. All environmental analyses, both EARs and EISs, will follow the basic format and guidance outlined in the Montana Environmental Analysis Handbook. It should be noted that the guidance provides for adequate flexibility, to adjust formats to deal with such issues as programmatic EARs, complex Regional EISs, and routine EARs not requiring intensive analysis. Districts are expected to use good judgement and have sound rationale for such adjustments.

The following is a summary by manual section of the objectives and responsibilities for environmental protection and enhancement.

Manual Section 1790 - Environmental Protection and Enhancement

	OBJECTIVE	RESPONSIBILITY
(1)	Establishing EA Standards	SO - Div. of Planning & EC
(2)	Compliance	DO

Manual Section 1791 - Environmental Analysis

	OBJECTIVE	RESPONSIBILITY
(1)	Establishing procedures, training, assistance, evaluations	SO - Div. of Planning & EC
(2)	Setting goals: units and man-months and program direction	SO - Div. of Resources
(3)	Setting schedule, preparing analysis, technical adequacy	DO
(4)	Direct SO Assistance on EARs	SO - Div. of Res./ Div. of Planning & EC
(5)	Submitting of EAR for technical review	DO (SO may require in some instances)
(6)	Coordination of EAR review in SO	SO - Div. of Planning & EC
(7)	EAR Review	
	---program concerns	SO - Div. of Res.
	---compliance concerns	SO - Div. of Tech. Svcs.
	---NEPA concerns	SO - Div. of Planning & EC
(8)	Recommendation for EIS	
	---initial action	DO
	---review	SO - Div. of Res./ Div. of Planning & EC
	---concurrence	State Director
(9)	Printing (major EARs only)	SO - Div. of Planning & EC

Manual Section 1792 - Environmental Statements

OBJECTIVE	RESPONSIBILITY
Recommendation to Bureau Director	State Director
Establishing goals: units and man-months	SO - Div. of Planning & EC/ Div. of Res.
Preparing EIS Preparation Plan	SO*
Preparing work specifications	SO*
Preparing EIS	SO*
Review and Approval	WO - EA Staff Department

*District responsibility when assigned EIS.

Manual Section 1793 - Review of Environmental Statements prepared by Other Agencies

	OBJECTIVE	RESPONSIBILITY
(1)	Establish review guidelines	SO - Div. of Planning & EC
(2)	Reviewing and commenting on statements	
	---proposed action significantly impacts Bureau programs	SO, DO, as appropriate
	---proposed action has little/no impact on Bureau	SO - Div. of Planning & EC
(3)	Consolidating Bureau comments	SO - Div. of Planning & EC
(4)	Lead Bureau and lead individual: to prepare Departmental review comments	SO - Div. of Planning & EC

1.2 SPECIFIC MONTANA ENVIRONMENTAL ANALYSIS POLICIES

PUBLIC PARTICIPATION - Major EARs will be prepared as public review documents. This includes use of a standard white cover (see appendix), application of clear understandable graphics and cartography (see appendix), and professional printing in adequate number.

- A minimum 30-day review period will be provided.
- Where substantial comments are received during the review of an EAR, a Final EAR (blue cover) will be issued reflecting these comments and their scientific substance in (1) the body of the EAR as appropriate, and (2) a Coordination and Consultation Section (see appendix and EA guidance).
- EARs will be distributed to the widest possible interested public and agencies for review.

INTERAGENCY COORDINATION

- Every effort will be made to involve other agencies throughout the major EAR process, either in a consultative or cooperative basis. This includes early notification that an EAR is anticipated with an invitation to participate. For some types of proposed actions there are fixed commitments requiring interagency coordination.

RELATION OF EA PROCESS TO BUREAU PLANNING

- All EARs and EISs will reflect, in Chapter 1, the management decision framework in which an action is being considered. This should normally include summary maps. URA information and MFP analysis should be reflected throughout the EAR/EIS. Particular attention should be given to the Physical Profile, and to critical environmental areas (see PAA, Ecological Profile).

PROGRAMMATIC EARs

- A programmatic EAR is to be employed only in instances dealing with similar recurring actions which do not typically have a significant environmental impact on an individual basis.

- An environmental analysis checklist, similar to that used in the Miles City Water Development Programmatic EAR, is properly used in conjunction with programmatic EARs. A separate EAR will be developed where the action, the environment, or the significance of impacts differ considerably from the typical situation described in the programmatic EAR.

LAND REPORTS, TECHNICAL EXAMINATIONS, EARs

- Land Reports, Technical Examinations, and Routine Analyses will be incorporated as a part of EARs unless a sound justification exists for handling them separately on a case-by-case basis. In such cases the technical report information will be summarized in Chapter 1 of the EAR. (Typical Title: "Land Report and Environmental Analysis Record for . . .")
- Special (non-EAR) requirements of technical reports will be included in Chapter 1 of EARs and Chapter 1 outlines revised as necessary. Otherwise, repetition should be avoided by adhering to the EAR format.

STATE OFFICE REVIEW OF EARs

- Unless SO review is required in conjunction with submission of case-related materials, or specifically required by the State Director on an ad hoc basis, District Managers will determine appropriate State Office involvement in and review of EARs.
- State Office involvement is encouraged on major EARs dealing with unusually sensitive situations.
- Unless otherwise directed, District Managers will determine what constitutes a major EAR and what SO involvement he wants on the analysis and preparation of the EAR.

EARs AND COMPLIANCE WITH STIPULATIONS

- All compliance officers - responsible for enforcement of any stipulations or conditions connected with BLM approval of an action - will certify on the EAR Face Sheet to having read the analysis (EAR) upon which stipulations may be based.

- The Environmental Analysis (EAR) will be attached or specifically referred to as a part of any action document - lease, permit, contract - issued under BLM jurisdiction in Montana, North Dakota, or South Dakota.

INFORMATION EXCHANGE

- Copies of major EARs will be sent to the State Office and other districts. Dissemination to other BLM states where EARs may have applicability is strongly encouraged, and should be arranged for through the State EAR Coordinator.

FIELD TRIPS

- All specialists working on a major EAR will be required to make a field trip of the area prior to completion of the analysis or have current knowledge of the area to the satisfaction of the responsible official.

IMPACT MONITORING

- Impacts will be monitored throughout the life of an action to (1) determine closeness of impact estimates in the EAR to fact, (2) insure that compliance measures meet both the legal requirement and the objective for which they were established. This will be done for all actions subject to majro EARs or EISs on an established schedule; and for routine actions on a by-exception or spot check basis.

1.3 PROCESSING OF ROUTINE EARs IN DISTRICT OFFICE

The basic procedure outlined below is suggested for the processing of any routine EAR (minimal documentation, programmatic checksheet, or standard format site specific).

Step #1 - EAR initiated by the resource area specialist (with the approval of the AM).

Step #2 - Completed EAR sent to the environmental coordinator for technical review and approval.

Step #3 - After review, the environmental coordinator attaches an EAR review cover sheet (see Appendix) to the EAR and passes the document on to the next appropriate reviewer (i.e. wildlife biologist, Chief of Operations, AM, etc.). In order to trace the path of an EAR through the offices of the district, the environmental coordinator maintains a suspense file of xeroxed copies of EAR review cover sheets.

Step #4 - Each reviewer, in turn, examines the EAR for adequacy (or other needs), then initials the cover sheet and passes the EAR back to the environmental coordinator. The environmental coordinator circulates the EAR through each reviewer for comments. In this manner, the environmental coordinator is able to keep "tabs" on the EAR at all times and also help expedite the review.

Step #5 - After the last reviewer has examined and initialed the EAR, it is returned to the environmental coordinator for final review. If any corrections are required, the EAR is returned to the originator for appropriate action. After the originator makes whatever corrections or modifications are necessary, he returns the EAR to the environmental coordinator.

Step #6 - The environmental coordinator, then, passes the EAR to the DM for his approval (or disapproval) and signature (when appropriate). The DM, then, discards the EAR review cover sheet.

Step #7 - The EAR, if approved by the DM, is then passed on to the docket clerk, who assigns the EAR a serial number and records the EAR on the district EAR register. If the DM does not approve the EAR, it is sent back to the originator (or AM) with appropriate instructions for disposition.

Step #8 - The docket clerk routes the approved, original EAR to the operations clerk for filing in the appropriate project file, and sends a xeroxed copy to the environmental coordinator for placement in his files. The environmental coordinator then discards the xerox copy of the EAR review cover sheet from the suspense file.

For those situations that do not fit the above procedure, the originator should check with the environmental coordinator to determine what adjustments are necessary.

1.4 STEPS IN PREPARATION OF MAJOR EAR

The District Manager, unless directed by higher authority, is responsible for establishing the level of analysis appropriate for the proposed action. The levels of analysis are broadly defined as routine or major. A major EAR requires complex interdisciplinary effort at the district level and often includes some participation from the State Office. These major interdisciplinary EARs involve most of the steps required in the preparation of an EIS and include the gathering or researching of data, analyzing and writing, reviewing technical or procedural aspects of the specific proposed actions and alternatives, consulting with other agencies, preparing for and working with the involvement of the public in reviewing the document, and preparing the recommendation on whether or not an environmental impact statement is recommended.

In keeping with the handbook objective of providing flexibility to adjust to individual conditions, the following steps are suggested but not mandatory.

1. EAR requirement determined - DM, Res, Ops, AM
2. EAR preparation plan - Res, Ops, AM/Staff, Environmental Coordinator
3. Data gathered - interdisciplinary team
4. Analysis completed - interdisciplinary team
5. EAR typed - Adm. Division
6. Environmental Coordinator reviews and attaches review cover sheet
7. EAR review - assigned by Environmental Coordinator
8. DM reviews and approves or requires changes
9. EAR forwarded to SO - Div. of Planning and Environmental Coordination
10. SO reviews EAR - Div. of Planning & EC, Div. of Res., Div. of Tech. Svc.
11. Review details completed, printing contract prepared
12. EAR printed and copies sent directly to DO
13. EAR mailed out for public review
14. Comments received at DO
15. Final EAR prepared

16. DM reviews for EIS recommendation and signs face sheet
17. EAR assigned serial no. - Docket Clerk
18. SO reviews final EAR - coordinated by Div. of Planning & EC
19. Final EAR printed by SO - Div. of Planning &EC
20. DO distributes final EAR - DO Adm. Division

STEPS IN PREPARATION OF MAJOR EAR

1. EAR requirement determined by District Manager, Asst. DM, RPM Staff or Area Manager.

2. DO Environmental Coordinator is informed of EAR requirement and anticipated level of analysis. Environmental Coordinator and originator establish EAR preparation plan based on project priority and include time table to estimated completion date and list of participants. If individuals in State Office are requested, it is reasonable to give approximately two weeks notice.

3. Analysis data is gathered from all available sources: project proposals, URA, MFP, activity plans, and inventories, other EA's technical reports, field examinations, contacts with other agencies and public, etc.

4. Analysis is completed and documented using the EA Guidance. In addition to the format in the EA Guidance, other aids to clarify the analysis may be used. For example, some sections of the optional Environmental Digest (Appendix 2 of BLM Manual 1791) might be used to assist in analysis and documentation.

5. Administration Division prepares a typed copy of the EAR.

6. Typed EAR is sent to Environmental Coordinator for technical review and attachment of EAR review cover sheet indicating individuals responsible for review. Environmental Coordinator maintains a suspense file of EAR review cover sheets to expedite processing of EAR.

7. After the last reviewer has examined and commented on the EAR, it is returned to the Environmental Coordinator who is responsible for coordination with the interdisciplinary team to complete whatever corrections or modifications are necessary.

8. The Environmental Coordinator forwards the EAR to the DM for approval (or disapproval). The DM, then, discards the EAR review cover sheet.

9. The EAR, if approved by the DM, is then routed to the Environmental Coordinator for completion of details for submission of EAR to SO Div. of P&EC. These details include special printing instructions, cost coding, quantities, establishment of review periods and deadlines.

10. Two copies of the document are forwarded to the State EAR Coordinator in the MSO Div. of P&EC. The SO provides the following reviews:
    (1) Br. of EC reviews for technical adequacy under NEPA
    (2) Div. of Resources reviews for program concerns
    (3) Div. of Tech. Services may review documents for compliance concerns

    These reviews should require a total of no more than two weeks.

11. State EAR Coordinator is responsible for timely processing of reviews in SO and details of printing requisition. If some rewriting or modification of the EAR is necessary, arrangements are made through the State EAR Coordinator.

12. EAR is printed by contractor and sent directly to originating District Office. Average time at printer is three weeks.

13. DO Administration Div. encloses cover letter in EAR and mails documents for review. Period of review is four to six weeks depending on number of reviewers, complexity of EAR, level of controversy, etc. Mailing list at DO is used including interested parties indicated by Public Affairs or as specified by Environmental Coordinator.

14. Comments from reviewers are received at DO and compiled by Environmental Coordinator based on environmental component and chapter addressed.

15. Final EAR is prepared through interdisciplinary team approach by responding to reviewers comments and updated project material. Steps 5, 6, and 7 are repeated. EAR face sheet is prepared by Environmental Coordinator and signed by team.

16. Environmental Coordinator routes EAR to DM for recommendation for/against need for EIS. DM recommendation on EIS is sent by separate memo to SO Div. of P&EC.
*If EIS is recommended, then no final EAR is printed at this time.

17. Docket Clerk assigns EAR serial number from register. Copy of EAR is placed in project file. EAR face sheet is completed with copies to DO Environmental Coordinator and State EAR Coordinator.

18. Two copies of final EAR are sent to MSO Div. of P&EC. Appropriate reviews are made and document is sent to printer.

19. Final printed EAR is sent directly from contractor to DO.

20. DO distributes final EAR with enclosed cover letter.

SECTION 2

EA CONTENTS

SECTION 2

ENVIRONMENTAL ANALYSIS CONTENTS

This section consists of environmental analysis (EA) guidance for the Introduction, Summary, eight National Environmental Policy Act chapters, and Consultation and Coordination chapter of an Environmental Impact Statement (EIS) or Environmental Analysis Record (EAR). Since this section is broken down by EA chapters and parts, the first item shows a table of contents as it would appear in an EIS or EAR. Material in italics applies to EARs.

ENVIRONMENTAL ANALYSIS CONTENTS

INTRODUCTION i

SUMMARY 1

Chapter 1 PROPOSED ACTION 1-1 *PROPOSED ACTION AND ALTERNATIVES 1-1*
(Routine EARs only)
PROPOSED ACTION
ALTERNATIVES

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GEOLOGY
TOPOGRAPHY
SOILS
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VEGETATION
ANIMALS
PREHISTORIC AND HISTORIC FEATURES
AESTHETICS
RECREATION
SOCIAL CONDITIONS
ECONOMIC CONDITIONS
LAND USE
ECOLOGY

Chapter 3 ENVIRONMENTAL IMPACTS 3-1
(Same 15 environmental component headings as shown in Chapter 2)

Chapter 4 MITIGATING OR ENHANCING MEASURES 4-1
(Same 15 environmental component headings as shown in Chapter 2)

APPLICANT'S (OR BLM'S) COMMITMENTS
ADDITIONAL ENFORCEABLE MEASURES
OTHER POSSIBLE MEASURES
RECOMMENDED MEASURES (EARs only)

Chapter 5 RESIDUAL ADVERSE IMPACTS 5-1
(Same 15 environmental component headings as shown in Chapter 2)

Chapter 6 SHORT TERM USES VS. LONG TERM PRODUCTIVITY 6-1
(Same 15 environmental component headings as shown in Chapter 2)

Chapter 7 IRRETRIEVABLE RESOURCE COMMITMENTS 7-1
(Same 15 environmental component headings as shown in Chapter 2)

Chapter 8 ALTERNATIVES TO THE PROPOSED ACTION 8-1

_____ ALTERNATIVE
(Same subheadings as under NO ACTION)
_____ ALTERNATIVE
(Same subheadings as under NO ACTION)
NO ACTION
DESCRIPTION OF ALTERNATIVE
ENVIRONMENTAL IMPACTS
MITIGATING OR ENHANCING MEASURES
RESIDUAL ADVERSE IMPACTS
SHORT TERM USES VS. LONG TERM PRODUCTIVITY
IRREVERSIBLE ACTIONS AND IRRETRIEVABLE
COMMITMENTS OF RESOURCES

Chapter 9 CONSULTATION AND COORDINATION (Add PUBLIC COMMENT in Title for final EA) 9-1

Chapter 10 INTENSITY OF PUBLIC INTEREST 10-1 (for all EARs)

Chapter 11 SUMMARY CONCLUSION 11-1 (optional for EARs)

APPENDIX (1, 2, 3, 4, 5, 6, 7, 8, 9, etc., as appropriate to correspond to chapters)

GLOSSARY

REFERENCES

INTRODUCTION

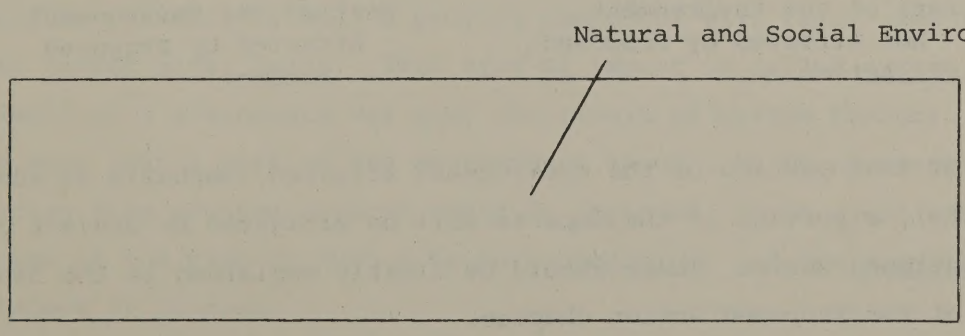
The introduction is to be a broad overview, background, scope of the environmental analysis, and is not to be a site specific introduction to the project. It should describe what an EAR or EIS is, why it is being done (NEPA, energy picture, etc.), what approach is being taken, and what procedures will be followed during and after the analysis. For example, who will make the decisions, when will the decisions be made, and what is the sequence of events for implementing or stopping the project. Help the public understand how the process of government, including the interjection of an EAR or EIS, works to make decisions.

Each proposal may have a different sequence of events leading to a decision. This would require a different introduction to each EA. On the other hand, this type of introduction can perhaps become a standard introduction for many similar EAs.

The following is a diagram summary of the environmental analysis process. It is simplified to highlight the major objective of each step in the process. Consider it for use in EA Introductions, or at least use it in conjunction with understanding the chapters in this section.

Environmental Analysis Process

For the purposes of this explanation, the diagram below represents the natural and social environment in which an action is going to occur. This may be a small or large geographic area. It may be an action proposed by a company, a series of actions, or an agency program.

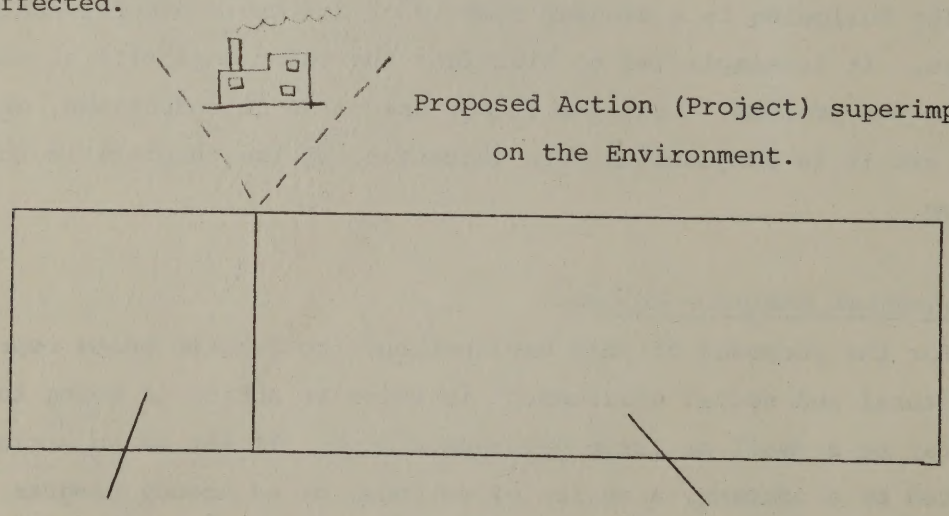


Description of the Proposed Action

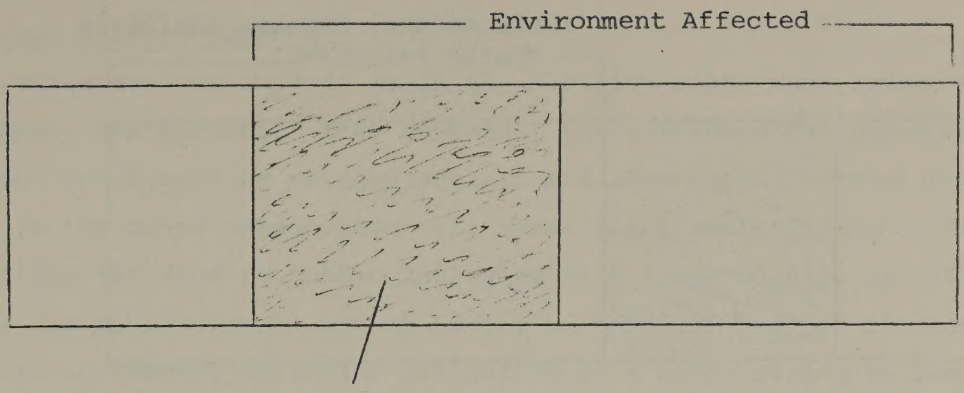
In order to analyze positive and negative environmental effects of the action, it must be considered in place, and must be described in satisfactory detail to understand its probable effect on the environment.

Any project will impact the environment. Most projects have measures built into them to lessen or eliminate many negative impacts. These include (1) steps proposed to meet legal or regulatory requirements and standards, such as air or water quality, and (2) features built into a project which, although not specifically required by law, still lessen an undesirable impact, or otherwise enhance the environment. An example would be the designation of a public recreation area in conjunction with an industrial development.

In describing the environment, it is important to distinguish which parts will or will not be affected by the action. The description of the environment should emphasize those elements which are likely to be affected.

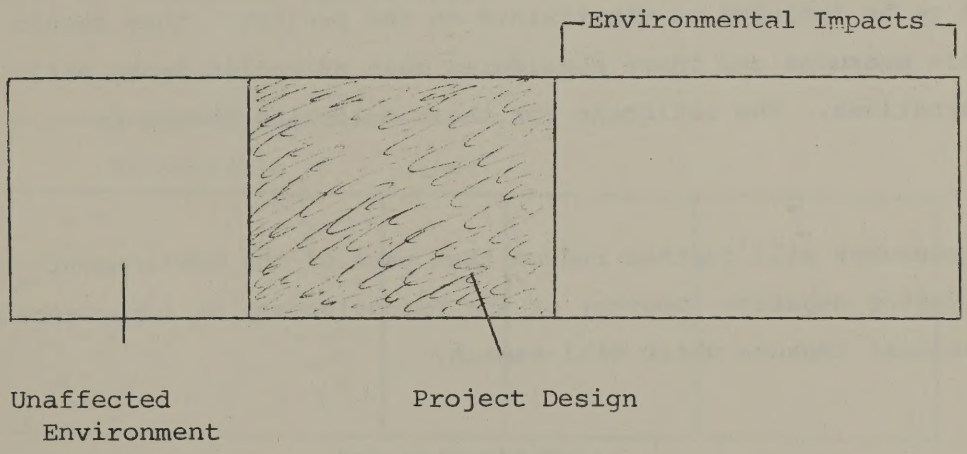

Proposed Action (Project) superimposed on the Environment.
Part of the Environment Not Affected by Proposed Action.
Part of the Environment Affected by Proposed Action.

Of that portion of the environment affected (emphasis on adverse impacts), a portion of the impacts will be mitigated by project plans as mentioned above. These should be clearly explained in the Description of the Proposed Action chapter.

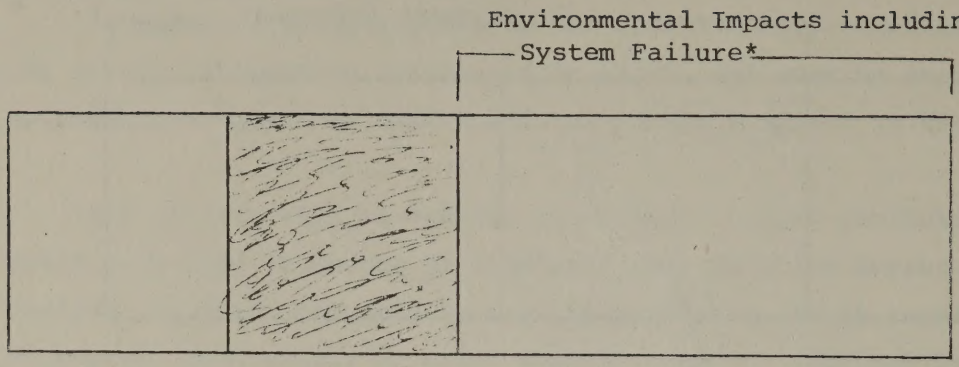


Environmental Impacts

The remainder of the analysis focusses on those adverse impacts which are not eliminated in the proposed action plan. The analysis should measure the quantity and importance of these remaining impacts.



There is also a second area which must be considered. There is always the possibility that a project component will fail. For instance, an oil tanker might burst. This type of impact is called system failure. The death of 3 astronauts was also the result of system failure. This would mean that a part of the environment thought to be adequately protected from adverse impacts would be impacted. This would require coverage of the risk of such a failure occurring, and the magnitude of the impact if it does.

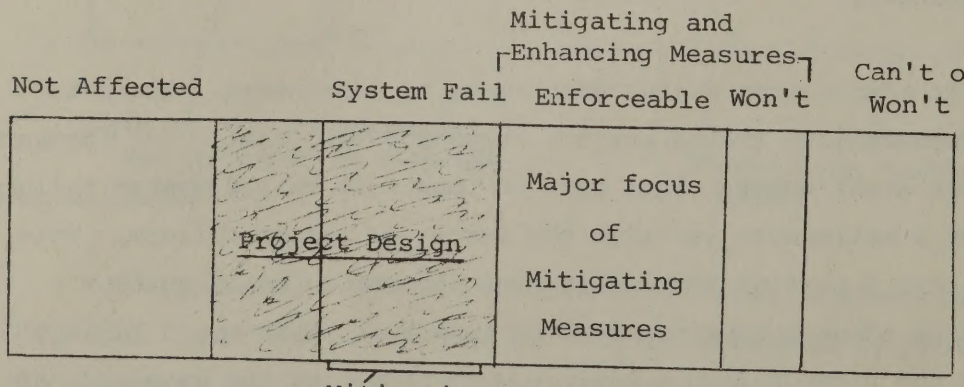


Mitigating or Enhancing Measures

This chapter reviews those measures not included in project design, evaluates other discretionary stipulations or requirements which are enforceable under existing jurisdictions, and notes other desirable measures which are not enforceable.

The focus of the chapter is on those measures which can reasonably be expected to be included as constraints on the project. They should be reasonable measures and those considered most effective among mitigation alternatives. The rationale for their selection should be explained.

These measures will further reduce that part of the environment which will suffer negative impacts, or the extensiveness or importance of those residual impacts which will remain.



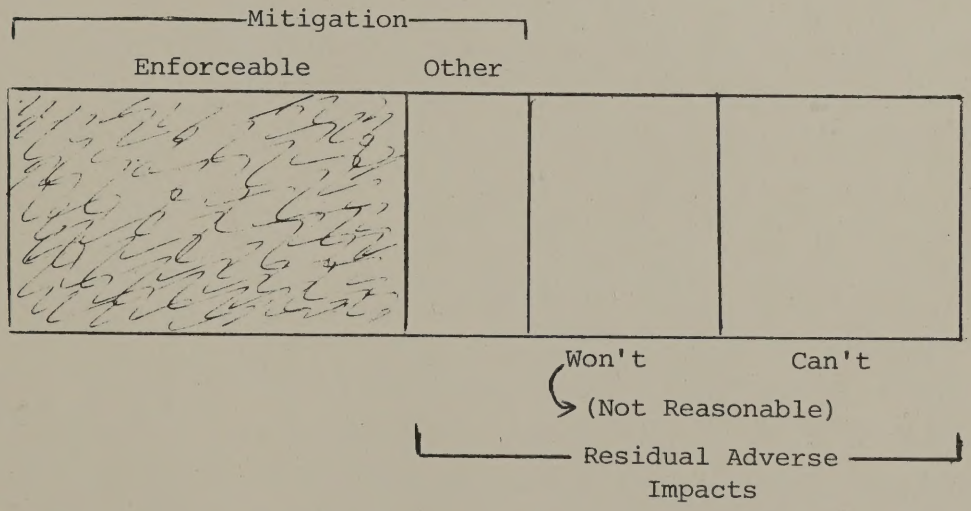
Mitigating measures here would be those designed to reduce system failure risk or to lessen impacts if they occur.

*Total subject of EIS Chapter 3.

Residual Adverse Impacts

These are the impacts which the decision maker must assume will accompany the project. They represent the environmental costs of the project which must be weighed against its advantages. These impacts fall in two major categories: (1) those which cannot technologically be eliminated (the aesthetic intrusion of a power plant), and (2) those where the mitigation is not realistic in terms of cost or similar factors (permanent sprinkler irrigation of a major mining reclamation project).

Also, impacts for which mitigation is technologically available but not enforceable must be included as residual. There is no way for the decision makers to insure that these "Other Mitigation" areas will be implemented (for example, there is no way to require in advance that Land and Water Conservation Fund money be made available to alleviate a shortage of recreation facilities).



SUMMARY

Briefly summarize the dominating factors (overview such as major impacts, public controversy, alternatives, special situations, etc.) reflected throughout the entire environmental analysis. This is done last, and then placed at the front of the document (after introduction and before Chapter 1) and paginated with single Arabic numerals. The Summary can also be printed and issued separately.

EIS's also require a Summary Sheet which appears before the Table of Contents (see BLM Manual 1792, Illustration 3).

CHAPTER 1

PROPOSED ACTION

Describe (1) essential background (essential past events, previous development, previous MFP recommendations), (2) project purpose or need, (3) exact location, (4) size, (5) time frame, (6) stages of implementation, (7) discrete operations, (8) expected project life, (9) design specifications, and (10) relationship with other projects, land uses, policies, and plans. It is usually preferable not to use all of these suggested items as subheadings, especially when the information under each topic is short, or when it requires repetitious introductory material for each topic. Simply write the needed information in a concise, clear, flowing narrative, with appropriate graphics, and with as few subheadings as possible. In describing purpose or need, an example of need would be to provide energy for _____; the need would not just be to mine the coal. Another example of need would be to remove timber for _____; this need would not just be to build a road to get to the timber.

Describe the above ten suggested items in sufficient detail to allow team members, publics, commenting agencies, and decision makers to assess impacts. Explain project components which are most likely to cause the impacts in more detail. Use photos, maps, tables, and other graphics.

Do not break this chapter into APPLICANT'S (OR BLM) PROPOSAL and AUTHORIZING ACTION subheadings. Describe the proposal, then follow up with a chart listing Federal, State, or local actions which would be necessary for the proposal to be implemented (for example, a Federal action would be required to grant a permit, lease, or right-of-way). For each action, identify the agency, describe legal authorities (such as acts, law, Code of Federal Regulations, etc.), and clarify the timing (during what project phase the action would be needed). This is related only to agencies with a decision role. Agencies with a

review function based on jurisdictional responsibilities, such as the U.S. Fish and Wildlife Service (Rare and Endangered Species Act and Wildlife Coordination Act), must be consulted, but the results are to be included in the "Consultation and Coordination" chapter.

A sample chart for authorizing actions is as follows:

STAGES OF IMPLEMENTATION and/or DISCRETE OPERATIONS	TIMING	ACTION, AUTHORITY, AND AGENCY

CHAPTER 1

In a minor EAR, if the alternatives, including "No Action," can be adequately covered in only a few sentences, cover them here in Chapter 1. In EISs and major EARs, all alternatives (including "No Action") are covered in Chapter 8.

PROPOSED ACTION AND ALTERNATIVES

PROPOSED ACTION

ALTERNATIVES (would begin a new page)

Name of Alternative(s)

CHAPTER 2

DESCRIPTION OF THE ENVIRONMENT

(Optional introductory paragraph, without heading)

CLIMATE) (Optional combination; be
AIR QUALITY) consistent with Chapter 3)
GEOLOGY - (including minerals and paleontology)
TOPOGRAPHY
SOILS
WATER
VEGETATION - (including crops)
ANIMALS - (including livestock)
PREHISTORIC AND HISTORIC FEATURES
AESTHETICS - (including noise and odor)
RECREATION
SOCIAL CONDITIONS
ECONOMIC CONDITIONS
LAND USE
ECOLOGY

The above 15 environmental components, which are to be derived from and consistent with those used for Chapter 3 (Environmental Impacts), are to each begin on a new page. "NonLiving," "Living," "Ecological Interrelationships," and "Human Values" are not used as headings. During final typing, it is not essential that environmental components begin on new pages if excessive space is wasted. However, be consistent one way or the other within Chapters 2 and 3. Also, it may at times be desirable to combine wording on some of the above environmental component headings. However, do not combine so broadly as "Land," "Human Values," and "Sociocultural Interests," etc.

It is usually preferable not to subdivide the environmental components into subcomponent headings unless extremely complicated. For example, when writing about air quality, there is usually no need to show movement patterns, temperature, particulate matter, carbon monoxide, sulfur oxide, etc., as subheadings, unless some of the items are extremely important and must stand out (such as a critical particulate situation for a power plant, which will also show up as a critical situation in

later chapters). Do write about all of those that are affected, but try to do it in one flowing narrative without subheadings.

Another example would be that water may or may not need to be subdivided into surface water and ground water subheadings. However, it is usually preferable that subheadings not be used for hydrologic cycle, sediment load, dissolved solids, chemicals, nutrients, solid debris, etc. Again, do write about all of those that are affected, but try to do it in a flowing narrative without subheadings (unless critical throughout the entire analysis). These examples also apply to the other environmental components. The environmental digest (Appendix 2 of BLM Manual 1791) subdivides all the environmental components into similar breakdowns as shown in the above examples. It is intended that all these items be used as a checklist to consider while analyzing. However, it is usually preferable to not show them as subheadings when writing about them in a flowing narrative. In fact, using all these checklist items as subheadings usually causes fractured and repetitious text. Consider them, analyze them, emphasize those most affected, and write about them in whatever way the story is best told. Whatever the choice, Chapters 2 and 3 should be consistent in heading subdivision. If it is needed in one chapter, it is needed in the other chapter. Anticipate Chapter 3 first. Chapter 2 should emphasize aspects of the environment most likely to be affected by the proposed action. The impact analysis (Chapter 3) does not have to be completed prior to writing the Description of the Environment (Chapter 2), but at least a preliminary analysis should determine the items most likely to be impacted and therefore the ones requiring description.

Areas generally covered under each of the components are indicated in Appendix 1, Figure 1. The components "Ecology" and "Land Use" are obviously not environmental elements. They are intended to cover important environmental relationships and competition for the use of the land base respectively. Ecology is to be used when certain environmental relationships are central to the analysis in a way that cannot be easily

discussed throughout the other sections; or when a series of relationship patterns (ecological land units, critical ecosystems, or life zones) are to be used as a basis for much of the analysis.

The environment without the proposal should be described as a changing situation. The existing environment should be described, but future "trends" should also show what the existing environment might be like in the future without the proposal. Emphasize things which are expected to change even without the project, especially where a "no action" alternative would actually be the continuation of another part of the project. Existing and Future should usually be interwoven together throughout the narrative, rather than being subdivided into separate headings. Also remember that the future environment is covered in the "No Action" alternative in Chapter 8.

Only describe relevant environmental components that would be impacted, and do so on a level with the expected magnitude, intensity, duration, and incidence of impact. For example, avoid historical factors which lead to present conditions. Again, only describe things which are relevant to understanding impacts. Use relevant maps, graphs, charts, and tables wherever needed (liberal use of quality graphics in this chapter helps reduce the need for lengthy detailed descriptions). In-depth details, such as climatological data, should be located in the appendix, and a summation presented in the narrative part of the chapter. Data gaps must also be identified.

CHAPTER 3

ENVIRONMENTAL IMPACTS

(In an introduction, without a heading, explain to the reader that this chapter analyzes impacts which are present after consideration of the mitigating design features included in the applicant's proposal. Explain that additional mitigation will be considered in the next chapter. Also clarify any special problems or approaches which relate this chapter to others.)

CLIMATE
AIR QUALITY
GEOLOGY
TOPOGRAPHY
SOILS
WATER
VEGETATION
ANIMALS
PREHISTORIC AND HISTORIC FEATURES
AESTHETICS
RECREATION
SOCIAL CONDITIONS
ECONOMIC CONDITIONS
LAND USE
ECOLOGY

The above 15 environmental component headings, which are to be the same headings as those used for Chapter 2 (Description of the Environment), are to each begin on a new page. "Non-Living," "Living," "Ecological Interrelationships," and "Human Values" are not used as subheadings, and no other new environmental component or environmental subcomponent subheadings should appear which were not used in Chapter 2. During final typing, it is not essential that environmental components begin on new pages if excessive space is wasted. However, be consistent one way or the other within Chapters 2 and 3. Also, it may at times be desirable to combine wording on some of the above environmental component headings. However, do not combine so broadly as "Land," "Human Values," and "Socio-cultural Interests," etc.

Although stages of implementation and discrete operations are considered under each environmental component during the analysis

process (Environmental Analysis Worksheet Forms) and even though the timing must be made clear, they are not to show up as headings or subheadings, nor are they to be segregated within the text. The text should be written as a flowing narrative which interweaves impacts of all stages on the environmental component by the project. In other words, show the reader in one place all the impacts upon each environmental component caused by the project. The reader's interest is in impacts over time, not by stages. As explained in Chapter 2, it is usually preferable not to subdivide the environmental components into environmental subcomponent headings. Write in one flowing narrative, consistent with Chapter 2.

Using an interdisciplinary approach, analyze, evaluate, and quantify where possible, the magnitude, intensity, duration, and incidence of any changes in the environment which would be caused by the project (ranging from best to worst). Emphasize major impacts and treat minor impacts in less detail. Show how the analysis process allowed the impacts to be determined, but do not include procedures (such as worksheets, matrices, etc.) in main body of the text. The procedures should be included in the appendix, and the process should be summarized to develop the main body of the text.

Analyze impacts based on the design features included in the proposals. As necessary, compare impacts to existing legal standards, citing the authority as a reference, but not including the entire acts, etc., in the Environmental Analysis. Also describe the range of impacts which could occur if the design features failed.

Show both cause and effect of impacts. For example, powerplant emissions cause a reduction in vegetative cover, but this loss of vegetation affects wildlife habitat, livestock grazing, or whatever. Another example would be that it is necessary to not only show that soil removal causes alternation of soil qualities, but also that this affects agricultural use, etc.

Address both direct (primary) and indirect (secondary) impacts. Direct impacts result from activities directly associated with the project. Indirect impacts result from activities that are not part of the project itself (such as homes, schools, new towns, additional industry which would be attracted to the area, increased highway use, etc.).

Trace impacts from one environmental component to the other. Each specialist should be aware that impacts on one environmental component may affect others. For example, interdisciplinary exchanges should make all writers aware that since mining would remove vegetation, vegetation would affect wildlife, and wildlife would affect recreation. This same mining removal of vegetation would also affect erosion, erosion would affect water quality, water quality would affect fish, and fish would again affect recreation. Normally, a change in vegetation would be noted in that section, together with a reference that it is/is not important to wildlife. The magnitude and importance of the affect on wildlife would then be discussed in the wildlife section.

Quantify impacts as much as possible. If exact quantification is not possible, say so; and at least identify where data is not available, and show a range of possible impacts. Professional judgment may be used but must be identified as such. Vague or general quantifying terms are not acceptable. Show a range of possible impacts in terms appropriate to the project, such as tonnage ranges of particulate matter, acreage ranges of vegetation, and percentage ranges of wildlife populations. Above all else, qualify impacts as to their importance, values, or significance. Vague terms such as positive or negative; beneficial or adverse; high, moderate or low; and significant or insignificant are not appropriate unless their importance in relation to man and the environment are described. Make clear the assumptions upon which value judgments are made.

CHAPTER 4

MITIGATING OR ENHANCING MEASURES

(In an introduction, without a heading, define mitigation as measures taken to minimize or eliminate impacts. Explain to the reader that this chapter will list the following three types of mitigating or enhancing measures: (1) Applicant's Commitments other than those discussed as design features in Chapter 1 (Description of the Proposal) (the analysis of impacts in Chapter 3 [Environmental Impacts] already took these particular migitating features into account, and this should be reiterated), (2) Additional Enforceable Measures which will be those that were not included in the proposal but which could be legally required to reduce impacts or enhance the existing environment, and (3) Other Possible Measures which will be those that may be desirable and technologically available, but are not enforceable [there is no way to guarantee that they will be applied].)

CLIMATE
AIR QUALITY
GEOLOGY
TOPOGRAPHY
SOILS
WATER
VEGETATION
ANIMALS
PREHISTORIC AND HISTORIC FEATURES
AESTHETICS
RECREATION
SOCIAL CONDITIONS
ECONOMIC CONDITIONS
LAND USE
ECOLOGY

Use environmental components, rather than stages, as headings, each beginning on a new page (compress in final if desirable). In some cases, certain environmental impacts are not mitigated; however, all environmental component headings used in Chapters 2 and 3 must be repeated so that the reader does not wonder if they have been overlooked. List the same headings and if some environmental components are not mitigable, simply say so and briefly explain why. Also, do not add or combine any environmental components to cause inconsistency with Chapters 2 and 3.

Under each of the affected environmental component headings, use the following three subheadings:

Applicant's (or BLMs) Commitments

Enumerate and analyze measures that the applicant has committed in writing to undertake but which are not identified in the proposal or among the State and Federal requirements below.

Additional Enforceable Measures

Frequently, regulations set standards and goals for the environment. How these standards and goals are to be achieved are left up to the discretion of Federal and State agencies having jurisdiction. Measures that should be used to achieve these standards and goals as well as the elimination of other undesired impacts are identified and analyzed here. Identify, by agency, those measures which should be required. Note: This section may be broken into Federal Enforceable Measures and State and Local Enforceable Measures as appropriate (Example: "Additional Enforceable Federal Measures" and "Additional Enforceable State and Local Measures").

Other Possible Measures

List other technically and economically feasible and desirable measures which are not enforceable by existing regulations. Explain to the reader that since "Other Possible Measures" are not enforceable, they are not carried forward into Chapter 5.

Chapter Approach

In writing this chapter, each measure must be specific and related to an adverse impact identified in Chapter 3 (including system failure, man-caused accidents, and common natural catastrophies). Analyze the effectiveness of each measure in reducing the impact, quantifying where possible, the reductions or enhancements of impacts. Discuss the uncertainties of the measures and the risk of failure (such as revegetation success probabilities). List the actions to be taken, not just the laws and regulations. Show how similar measures worked in the past. Identify requirements for monitoring, and identify who could be responsible for them. Also show what would be done if monitoring surfaced an unexpected impact or mitigation failure.

Recommended Measures *(EARs only)*

List the mitigating measures recommended by the EA writing team. This is an optional section.

CHAPTER 5

RESIDUAL ADVERSE IMPACTS

(In an introduction, without a heading, explain to the reader that residual adverse impacts are those that would remain after application of the "Applicant's Commitments" and "Additional Enforceable Measures" from Chapter 4; but that "Other Possible Measures" are not carried forward.)

CLIMATE
AIR QUALITY
GEOLOGY
TOPOGRAPHY
SOILS
WATER
VEGETATION
ANIMALS
PREHISTORIC AND HISTORIC FEATURES
AESTHETICS
RECREATION
SOCIAL CONDITIONS
ECONOMIC CONDITIONS
LAND USE
ECOLOGY

Use environmental components as headings. This can be done in one of two ways: (1) list the same environmental components as used in Chapters 2, 3, and 4, and for the environmental components not having residual impacts, simply say so and briefly explain why; or (2) list only the environmental components which do have residual impacts, and assume that it will be clear that those not appearing here were mitigated in Chapter 4. In either case, if desirable, compress environmental components, rather than beginning each on a new page, but do not add or combine any environmental components to cause inconsistency with Chapters 2, 3, and 4.

For each environmental component, present a narrative description of residual impacts (impacts from Chapter 3 minus Mitigation from Chapter 4). Analyze, evaluate, and quantify the magnitude, intensity, duration, and incidence of any changes in the environment which would occur after mitigation has been applied (ranging from best to worst if

mitigation failed). Again, above all else, stress the importance, value, or significance of the change. It is not necessary to repeat the analysis of how the impact was determined, but magnitude, intensity, duration, and incidence must be described as done in the Impacts Chapter, and the value judgment assumptions reiterated or referenced.

Also, identify importance and magnitude of possible impacts from system failure, failure of mitigating measures, man-caused accidents, and common natural catastrophies.

CHAPTER 6

SHORT TERM USES VS. LONG TERM PRODUCTIVITY

(In an introduction without a heading, define and explain short term and long term to the reader: Usually, for industrial projects, short term means the life of the project, and not simply construction time. Usually, long term means an indefinite period beyond the life of the project. However, when projects (such as grazing or damming) have a life span of more than thirty years (one generation), which would make it difficult to determine when the long term would begin, then the construction period can be used for the short term period. What has the short term use by the project done to the long term productivity of the total environment after the project is gone? The proposed action may involve tradeoffs between short term commitments of resources to the project and the long term maintenance, availability, and regeneration of environmental values.)

CLIMATE
AIR QUALITY
GEOLOGY
TOPOGRAPHY
SOILS
WATER
VEGETATION
ANIMALS
PREHISTORIC AND HISTORIC FEATURES
AESTHETICS
RECREATION
SOCIAL CONDITIONS
ECONOMIC CONDITIONS
LAND USE
ECOLOGY

If desirable, use those environmental components, that are effected, as headings, each beginning on a new page (compress in final if desirable). Under each environmental component, discuss short term use vs. long term productivity in a flowing narrative. Do not add or combine any environmental components to cause inconsistency with Chapters 2, 3, 4, and 5.

In some cases, it may not be necessary to use any of the environmental components as headings. If short term use vs. long term productivity can be discussed more effectively in a flowing narrative without any environmental component headings or by using whatever alternate topical headings best portray these relationships, do so.

In writing this chapter, point out where short term uses of one resource may be a tradeoff with the long term productivity of another resource. In other words, what would the project do to the long term productivity of the environment and the range of options available to future generations? Quantify data to the extent possible. Also, discuss cumulative impact results of the proposed action with other potential, planned, or ongoing actions.

The reduction of deer population/habitat because of a mining operation may be a short term sacrifice which, if reclamation and other factors allowed, would not affect the long term population and habitat values of the area. In other words, it could be expected that habitat would return and populations recover to former levels, with the short term sacrifice not affecting the area's long term productivity for wildlife. These relationships are discussed in Chapter 6.

Permanent loss of habitat/populations is an irretrievable resource commitment and is discussed in Chapter 7. The elimination of the buffalo from the Great Plains as a result of hunting and human settlement is a good example.

CHAPTER 7

IRRETRIEVABLE RESOURCE COMMITMENTS

(An introduction, without a heading, should explain that the purpose of this chapter is to identify project impacts that will cause irreparable damage or permanent (or exceptionally long term) changes to the environment.)

CLIMATE
AIR QUALITY
GEOLOGY
TOPOGRAPHY
SOILS
WATER
VEGETATION
ANIMALS
PREHISTORIC AND HISTORIC FEATURES
AESTHETICS
RECREATION
SOCIAL CONDITIONS
ECONOMIC CONDITIONS
LAND USE
ECOLOGY

If desirable, use those environmental components that are effected, as headings, each beginning on a new page (compress in final if desirable). Under each environmental component, discuss irretrievable resource commitments in a flowing narrative. Do not combine any environmental components to cause inconsistency with Chapters 2, 3, 4, 5, and 6.

In some cases, it may not be necessary to use any of the environmental components as headings. If irretrievable resource commitments can be discussed more effectively without any environmental headings, do so.

In writing this chapter, describe and quantify extraction of minerals; destruction of archaeological sites; elimination of wildlife species; permanent changes in land use; permanent changes in lifestyles; erosion of soil; loss of human life; project consumption of materials, fuels, etc. (construction, operation, and maintenance); and other natural and cultural resources losses caused by the project.

An irreversible action is one which, for costs or other reasons, is unlikely to be changed. A major hydroelectric dam is such an action. The sacrifice of riparian habitat and/or bottom land crop production capability resulting from the dam and reservoir may be considered irretrievable commitments of those resources, as are the materials and energy used in building the dam.

CHAPTER 8

ALTERNATIVES TO THE PROPOSED ACTION

(Analyze the "No Action" alternative, and other pertinent alternatives, in whatever depth necessary to compare to the original proposed action. Also use the same heading and subheading rules for consistency. *In routine EARs where simple alternatives could be covered in only a few sentences in Chapter 1, Chapter 8 would not be used.)*

----------ALTERNATIVE(S)

(Analyze each significantly different action which provides similar benefits with different environmental impacts.)

Description of Alternative

(The Description of the Environment is not repeated unless the area that would be impacted is different than the original area described.)

Environmental Impacts

Mitigating or Enhancing Measures

Residual Adverse Impacts

Short Term Uses vs. Long Term Productivity

Irreversible Actions and Irretrievable Resource Commitments

----------ALTERNATIVE(S)

(Analyze each alternative with different design(s), partial implementation(s), delay(s), or different location(s) which modify the proposed action.)

Description of Alternative

(The Description of the Environment is not repeated)

Environmental Impacts

Mitigating or Enhancing Measures

Residual Adverse Impacts

Short Term Uses vs. Long Term Productivity

Irreversible Actions and Irretrievable Resource Commitments

NO ACTION

Description of Alternative

(The Description of the Environment is not repeated)

Environmental Impacts

Mitigating or Enhancing Measures

Residual Adverse Impacts

Short Term Uses vs. Long Term Productivity

Irreversible Actions and Irretrievable Resource Commitments

CHAPTER APPROACH

In writing this chapter, first describe the "no action" alternative. "No action" would be the possibilities that (1) the proposed action would not occur, (2) an ongoing project would continue without a proposed modification, or (3) that in the case of a BLM proposal, the proposal would be cancelled and the present BLM program would continue. Describe and quantify the effects and consequences of whatever the "no action" alternative may be. If "no action" is, for example, "continuation of mining without the proposed lease modification," substitute those actual words rather than using "no action."

Secondly, identify, describe, and analyze alternatives which are technologically feasible and reasonably available. Each alternative must be analyzed and quantified to the extent necessary to allow comparison of impacts with the proposed action. It is appropriate to consider alternatives which are beyond the BLMs or Department's existing authority. Economic costs are not limiting factors. The most promising alternatives (those which have less residual adverse impacts) require the most detail. If an alternative, which might appear to be one which should have been considered, is not considered, say why it was not.

CHAPTER 9

CONSULTATION AND COORDINATION

The Consultation and Coordination chapter must adequately describe consultation and coordination which took place while preparing the EA. List the agencies and individuals contacted, and describe the nature of their input. Also identify the types of public forums available throughout the Draft and Final stages.

The discussion of input can be structured by agency, interest groups, and individuals. Agency groups can be divided into those with jurisdiction, environmental expertise, and those required by coordination requirements contained in such acts as the Fish and Wildlife Coordination Act, National Preservation Act, Endangered Species Act, etc.

In the Final EA, this chapter must be expanded to include the public comments and responses. Therefore, for the Final EA, change this chapter's title to CONSULTATION, COORDINATION, AND PUBLIC COMMENT. In most cases the large number of comments require a separate appendix. Analyze substantive issues raised in the comments and testimony, and make text changes where needed. Do not just answer comments, but recognize the problems and issues raised, and discuss them.

(for all EARs)

CHAPTER 10

INTENSITY OF PUBLIC INTEREST

As a result of the consultation and coordination and any other contacts with agencies, groups, and individuals, identify and describe the natures and levels of interest. Base this on knowledge of the area, previous experience with similar actions, responses, and previous MFP preparations, in relation to environmental impacts and issues. Also describe the degree of review that will be needed.

(optional for EARs)

CHAPTER 11

SUMMARY CONCLUSION

This is not to be a judgment on the need for an EIS, which the responsible official does by separate memorandum. It is, however, an option to make the writing team's professional opinions known concerning the dominating factors reflected in the analysis. These could include:

- *the residual impacts*
- *discussion of short term uses and long term productivity*
- *irreversible and irretrievable commitments of resources*
- *level and nature of public interest*

SECTION 3

MANUSCRIPT PREPARATION

SECTION 3

MANUSCRIPT PREPARATION

WRITING STYLES AND FORMATS

Choosing styles and formats for an EA often presents problems for both the editor and authors. An EA is considered a technical document, but it is to be written so that the average reader of, for example, Reader's Digest, Field & Stream, or a newspaper can understand it. Compliance with NEPA and BLM guidelines, readability, time factors, and ease of preparation must all be considered. Sufficient time should be allowed for the editor to designate the appropriate choices, before any writing begins.

Ideally, authors should be able to maintain their own style and choose any of several acceptable formats. Reviewers and editors would then alter or edit the manuscript to the author's satisfaction, and act as liaison between the author and the production department. However, when an author's work is only one part of a group effort, each author must conform to pre-selected standards. Pride in authorship must therefore be primarily in teamwork, and not so much in style or format.

One style, one format, and one method of preparation, must be designated. This does not always mean that the choice made is the only one available, but it will at least allow for consistency. If special problems develop, or if an improved method is discovered, it is easier to convert or modify when all work is consistent.

Suggested Guides

It is highly recommended that the most current edition of A Manual of Style by the University of Chicago Press be used as the EA format and rule reference. The book addresses the differences between writing for the humanities and writing for the natural sciences. It indirectly offers solutions to most problems encountered in EAs, is widely accepted, and is very complete.

A Manual for Writers by Kate L. Turabian (Fourth Edition) is a good additional reference, but it, too, is published by the University of Chicago Press, and it appears to be a condensed version of A Manual of Style, without as many options or full explanations.

McGraw Hill Book Company's Reference Manual for Stenographers and Typists is another good addition to writer's, editor's, and typists' libraries.

The Government Printing Office Style Manual can help, but it is " . . . primarily a GPO printer's stylebook . . . ", " . . . assumes that editors are versed in correct expression . . . ", and " . . . uses terms which are obvious to those skilled in the graphic arts . . . ".

Team Briefing

All writers should be briefed on points in this section before any writing is begun. Several useful writing guides may be suggested, but team members should have already been selected partially on their report writing abilities. Grammar should usually be discussed only where it may present specific EA problems.

The fact that the EA is to be written for the public is a point which cannot be overemphasized. Even though an EA is to assist "decision makers", it is foremostly to be written in a style which can be easily understood by the general public.

There are a number of general rules or suggestions which can be used or adapted to make formats as uniform as possible from the beginning stages. Where options are available, definite choices must be designated and the various options should no longer be available to authors.

Rules are not always rigid, but they should be known before it is decided to break them. Since an EA is technical, yet intended for the average reader, rules can be used from the humanities or from the natural sciences, or the rules can be modified to incorporate the best of both.

Work Outlines

A working outline of what the EA should cover can be developed in one of three forms:

1. Topical - outlining with a series of logical main topics.
2. Key-phrase - outlining with complete and specific phrases.
3. Sentence - outlining with complete topic sentences.

Topical and key-phrase outlines are easiest to prepare, but may not thoroughly guide the writers' efforts. The sentence outline is the most difficult to prepare, but may provide maximum aid to writers.

The most conventional working outline is as follows:

I. (Chapter Title Level)
  A. (Section Head Level)
    1. (First Subhead Level)
      a. (Second Subhead Level)
        (1) (Third Subhead Level)
          (a) (Fourth Subhead Level)
          (b) (Fourth Subhead Level)
        (2) (Third Subhead Level)
      b. (Second Subhead Level)
    2. (First Subhead Level)
  B. (Section Head Level)
II. (Chapter Title Level)

Another method for developing a working outline is as follows:

1.0 (Chapter Title Level)
1.1 (Section Head Level)
1.1.1 (First Subhead Level)
1.1.1.1 (Second Subhead Level)
1.1.1.1.1 (Third Subhead Level)
1.1.1.1.1.1 (Fourth Subhead Level)
1.1.1.1.1.2 (Fourth Subhead Level)
1.1.1.1.2 (Third Subhead Level)
1.1.1.2 (Second Subhead Level)
1.1.2 (First Subhead Level)
1.2 (Section Head Level)
2.0 (Chapter Title Level)

It is preferable that outline numbering and lettering not be used in the manuscript. However, it may be decided that a decimal numbering system within the manuscript can offer easy cross-reference. If it is determined that manuscript decimal numbering is essential, place the numbers in the left margin to avoid visual clutter. Also, use the decimal numbers only to the third level. If decimal numbering is to be used in the text, begin using it in the first working outline (also see decimal number usage in Appendix 3, Figure 1).

Converting the Working Outline into the Narrative Text

A detailed working outline should include all essential sub-components, elements, primary characteristics, and change agents, which should be considered during the analysis. The detailed working outline is an excellent tool for organizing one's thoughts. However, most of the items included in the working outline should not appear as subheadings in the written narrative. The editor should designate the major heads and subheads which are necessary to meet requirements and maintain

consistency, and the authors should try to use no more subheadings than are absolutely necessary (see "Subheads" below; and Appendix 3, Figure 1).

Subheads

The method for using heads and subheads is shown in Figure 1-1.

Figure 1-1
SUBHEADS

6
CHAPTER NUMBER
2
CHAPTER TITLE

4
SECTION HEAD

4
First Subhead
2
Paragraphs

4
Second Subhead
2
Paragraphs
2 (4 if another second subhead)
5 Third Subhead. Paragraphs

(Also see Appendix 3, Figure 1, for several examples, typing instructions, etc.)

Running Heads

Whenever time permits, editors should arrange for running heads during final typing. This process, of placing chapter titles in the upper left corner of left-hand pages (verso); and placing section heads (environmental components) in the upper right corner of right-hand pages (recto), has been omitted from most EAs. It can greatly assist EA readers and should be done. See A Manual of Style for further details. Each new chapter should begin on right-hand pages (recto), if running heads are to work.

Index

Because of the technical nature and time factors involved in EAs, and since meaningful heads, subheads, running heads, and tables of contents should be used, an EA index is not required.

Glossary

Each author should prepare definitions for a glossary. Glossary words should be arranged alphabetically, each on a separate line, and should have no end punctuation unless containing more than one sentence definitions.

Faulty Writing and Grammar Rules

There is not usually enough time for authors to re-read writing guides, but machine copies of short precise sections on methods of reducing writing faults should be given to authors as refreshers. Words and Ideas by Hans P. Guth, Wadsworth Publishing Company, San Francisco, has excellent sections on imprecise connectives, words often confused, redundancy, padding, euphemisms, jargon, flowery diction, and triteness, which are particularly applicable to EA writing.

Other potential grammar problems may also warrant refresher sheets. Rules can be copied from books mentioned herein, or the editor can originate a composite listing of the rules which may most specifically apply. An example of such a listing to be given to all team members, might be as follows:

1. The EA reader may begin reading in any volume, chapter, or section. Therefore, if abbreviations or acronyms are essential, spell them out for first usage in each section (each environmental component); parts per million (ppm) or National Environmental Protection Act (NEPA). Then use ppm or NEPA thereafter. Acronyms should be minimal and should not be grouped together.
2. Parenthesis to be double when beginning a listing: (1).
3. Ellipses usually to be three . . .
4. (Complete sentences, standing alone, enclosed in parenthesis are punctuated within the parenthesis.) Parenthetical insertions within a sentence have no punctuation (as shown here) and do not begin with a capital letter unless a proper noun, or unless a complete separate sentence.
5. In sentences containing two independent clauses joined by and, but, nor, or for, a comma is to be placed before the conjunction.
6. Use semicolons instead of commas when separating elements in series if commas are used within any element.
7. Use a comma before the conjunction separating a series (apples, oranges, and grapefruits).
8. Use a comma both before and after <u>etc</u>. when following a series (apples, oranges, etc., are fruit).
9. Use "data is" rather than "data are".
10. Aesthetics, not esthetics; and archaeology, not archeology.
11. If you <u>a</u>ffect something, you will see an <u>e</u>ffect.
12. It is important to see that the word <u>would</u>, rather than <u>will</u>, is used when mentioning what the project <u>would</u> do, or what

impacts would occur. An EA discusses what would happen if the proposal were to be implemented. It should not be inferred that the proposal will be approved.

13. When pluralizing acronyms or letters, simply add the s without an apostrophe (EISs), unless it would cause confusion (x's and y's).

14. The general rule for the use of numbers in EAs should be to spell out numbers up to ten; or numbers beginning a sentence. Figures should be used for numbers over ten (and all other numbers under ten if used in a series with numbers over ten), decimals, percentages, fractions, money over ten dollars ($11, $ symbol also to be used with figures), dates (May 21, 1975 - comma also to be used), time of day (9:00 a.m. - not "nine o'clock in the morning"), and governmental designations if over ten (592d Ordinance Company; but Nineth Congress). Very large numbers are to be expressed in figures and units (32 million); and commas are to be used with 1,000 or more (except for years - 1975). If numbers are used in a listing, the number is to be indented five spaces and followed by a period. Plurals of numbers as figures are to be formed by adding an "s" without an apostrophe.

Dictaphones

It should be decided whether dictaphones can be used by authors. The use of dictaphones can offer a rapid method of proceeding from thoughts to first draft, but they have a definite tendency to cause wordy drafts which are seldom properly shortened.

Objectivity

Writers should always attempt to be objective. However, professional opinions are valid, and are often needed because of a lack of sound

scientific data. The author has a responsibility to draw these opinions, but the opinion must be objective, unbiased, un-emotional, identified as the author's professional opinion, and must not be presented in such a manner as to infer endorsement or rejection of a particular course of action.

References

If authors are not immediately briefed on reference styles, a total lack of references may occur, or a wide variety of reference styles will make it difficult to convert them to a consistent style.

In the natural sciences, a list of cited works is usually headed References (as opposed to the humanities in which cited works are headed Bibliography).

Footnotes may be used in the text, but another method is preferable for ease of preparation and readability. The last name of the author, page numbers, and date of publication should be enclosed in parenthesis in the text at the appropriate point. Details are then given in the list of references at the end of the document. The list of references is to be the last item in the document and is not to be placed between the text and the Appendix (or they can be placed at the end of each chapter).

A typical arrangement for the reference listing includes the author (last name first, and first and middle initials), date, the title of the publication (with only first word capitalized), and the remaining facts of publication. Each reference should begin flush left with no paragraph indention and should have runover lines indented three spaces.

It is also permissable to use a discussion type of bibliographical essay (such as that used at the end of this chapter).

See the section on Bibliographies in A Manual of Style for further examples on referencing books, journals, and personal contacts. It is suggested that the Editor make copies of those portions pertaining to preparation of references, and give them to each author before work is begun.

Consultation and Coordination

A summary of all personal visits, telephone calls, correspondence, and other contacts concerning EA preparation should be kept up to date by each author. This information will be used in compiling the "Consultation and Coordination" chapter. "Consultation and Coordination" is to be a separate chapter and is not to be included in the list of references or in the appendix.

Tables, Figures, and Maps

Typed column listings should be referred to and labeled as tables. All maps should be referred to and labeled as maps. All other illustrations such as photographs, charts, graphs, drawings, and paintings should be referred to and labeled as figures.

As a general rule, if something can clearly be described in a few words, there is little need for a figure, table, or map. Yet, supporting figures, tables, and maps which can help clarify the text should be given increased emphasis. They can assist in abbreviating what otherwise would require a lengthy description, can add interest and variety, and can cause the reader to respond. This is especially true in Chapter 2 (Description of the Environment). Do not use material so complex or dull as to cause the reader to pass it by, and do not use Xerox, borderless, unlegended, and otherwise unprofessional maps, etc. Also, keep figures, tables, and maps simple by not including too much information or too many variables in one item.

Do not leave figure, table, and map numbers blank. Each author should number all tables, figures, and maps, according to sequence and chapter, such as Table 3-1, Table 3-2; Figure 3-1, Figure 3-2; and Map 3-1, Map 3-2; etc. Even if the author knows this will not be the final numbering, this enables reviewers and editors to assure the proper sequence, and correctly renumber as changes are made.

Authors should usually include only rough sketches, descriptions, or copies of figures and maps with circulating draft materials. The Cartographer can assist authors by providing base maps, rough sketches, etc., but final tables, maps, and figures are not to be assigned to cartographers until cleared through the Technical Coordinator and Editor. This will prevent cartographic preparation of tables, figures, and maps which may be deleted during the review process. All preliminary tables, figures, and maps are reviewed by the Technical Coordinator and Editor to assure that inclusion is desirable, and to determine whether the material will remain in the text or be placed in the appendix. Only then should the material go to the Cartographer.

The author must refer to tables, figures, and maps at appropriate places in the text. If tables are short and simple, they may be typed within the text, as close to the point of reference as possible (usually within two pages), but not before the point of reference. Longer and more complex tables, and all figures and maps, should be on separate pages to prevent typing spacing problems. (Small tables, figures, and maps can be combined to fill a page if they remain close to, but not before, the appropriate text reference.) Tables, figures, or maps remaining in the main body of the statement (rather than being placed in the appendix) are to have pages numbered in sequence with the text. Supporting tables, maps, or figures which are not essential within the main body of the statement, and usually those that are referred to in more than one chapter, should be placed in the appendix.

Each author should see that all preliminary figures, tables, or maps are at all times included with circulating draft material. The author should never simply insert a note telling someone else where to get the material that needs to be reproduced.

Figures, tables, and maps should also be titled (caption) at the top. The caption should be in all capitals, should be centered below the number of the table, map, or figure, and should not have end punctuation. Any explanatory phrases or sentences (legends) should be centered below the illustration, and should be capitalized and punctuated sentence style.

Figures, tables, and maps which must be turned sideways should be turned with the bottom at the outside margin (unless a continuing page-to-page series overlaps pages, in which case the entire series should face the same direction). If "turning the bottom out," captions and numbers should be moved to the right margin where they are easier to see.

Multi-author works, and works with few or many tables, figures, or maps commonly do not include a formal list of illustrations. However, as a double check for inclusiveness, and for an optional formal list of illustrations, each author should also list on a separate sheet, all figures, tables, and maps that are to be included for each section. This should include the figure, table or map number, size, and a brief description.

Appendix

The purpose of the appendix is to offer explanations and elaborations which are not essential in the text but which are essential to specialists seeking further clarification, long lists, charts, tables, etc. The appendix should not, however, simply be a place for unnecessary miscellaneous items the author was unable to work into the text, and should not include items which can easily be referenced.

Appendices should be sectioned and numbered, Appendix 1, Appendix 2, etc., according to chapter (different colored pages for each appendix could be used to assist the reader in finding the appropriate appendix). Appendices should be placed in a separate volume at the end of a multi-volume EA. Even in short EAs, it may be decided that it would be less overwhelming to the reader, and more helpful in using the text and an appendix item at the same time, if the appendix is printed separately.

All items should be labeled with appendix number, and figure, table, or map number, in the bottom right corner of the page (for example, Appendix 2, Figure 7; Appendix 2, Table 3; etc.). Note that figure numbers, rather than page numbers, are used. However, where a figure has more than one page, label it as, for example, Appendix 5, Figure 4, Page 1 of 12 pages. Within each appendix, figures, tables, and maps may be mixed or separated.

Page Numbering

Pages should be numbered according to chapter and should begin over for each chapter (for example, Chapter 1: 1-1, 1-2, 1-3, etc.; Chapter 2: 2-1, 2-2, 2-3, etc.). This will allow continuous page additions or deletions within each chapter, without requiring renumbering of the entire manuscript. As mentioned on page 12, figures, tables, and maps used in the text should also be paginated. Paginate appendices according to the above paragraph.

Blue pencil (Robin-egg blue) can be used in lieu of typing, while page numbers are subject to change. By placing tentative page numbers off-center, final page numbers may later be typed in the bottom center, and the blue pencil numbers will not reproduce when printed.

Final Layout

The final layout of the EA manuscript should be in the following format:

- Front cover
- Inside title page (see BLM Manual 1792, Illustration 2)
- Summary sheet (EIS requirement - see BLM Manual 1792, Illustration 3)
- Contents (list of illustrations is optional and usually not necessary for multi-author works)
- Introduction
- Summary (can be a separately printed booklet)
- Body of Statement (eight required chapters)
- Consultation and Coordination (must be a separate chapter; is not to be placed in appendix)
- Appendix (may be more than one)
- Glossary
- References (or may be placed at the end of each chapter)

Contents

Roman numeral outlines should not be used in developing the final table of contents (titled simply "Contents"). Use chapter numbers, and indent for each subheading (see Contents for this handbook for example). If the Arabic decimal numeral option is used in the text, these numbers should then also be used in the left margin of the table of contents.

The table of contents is prepared after the manuscript is completed. At least the chapter title, section head, and first subhead should be listed. Any other essential subheads can also be used. Since an index is not prepared, all subheads should have corresponding page numbers. Place the page numbers three spaces after the headings rather than dotting a line across the page.

TECHNICAL REVIEW AND EDITING

Preparation of Draft

In preparing for the review and edit process, typing should at least be double spaced, and perhaps preferably triple spaced. Normally, the printed EA is double spaced, but it is more desirable to use 1 1/2 spaces which is pleasing to the eye, conserves paper, and still allows notes to be placed in between lines.

Each chapter, and each chapter section (environmental components) should begin on a new page. Even though the EA should be reviewed and edited in sequence, beginning each section on a new page allows review, editing, rewriting, or retyping on a section by section basis. In the final document, it also makes it easier for the public to find the environmental components.

Authors should type or write their own field notes and preliminary ideas. They should not submit extremely rough work to the typists. Work should be given to the typists only when the author feels that the material is reasonably close to being ready for review. Authors and typists should follow the format shown in Appendix 3, Figure 1, for spacing, heads, subheads, indentation, margins, etc.

References, and rough tables, maps, and figures should be attached to the draft throughout the entire technical review and editing process. The team leader, editor, or technical coordinator should establish a management tracking system which should be adhered to by all people involved in the preparation and review process.

Review Procedures Within EA Team

The Technical Coordinator should establish an internal flowchart which assures that all deadlines are met, and which shows where all chapters and sections are at all times.

Also, each section should have a cover sheet attached while circulating. This cover sheet should include the following:

FIGURE 3-1

SAMPLE REVIEW COVER SHEET

(To be given to all authors)

CHAPTER _____ MAG CARD # _____

ENVIRONMENTAL COMPONENT _____

PAGES _____

AUTHOR _____

WORK GROUP LEADER _____	Initial	Date
1. First Draft Completed	_____	_____
2. Initial Typing	_____	_____
3. Author (and/or Work Group Leader*) Review	_____	_____
4. Copies and Filing	_____	_____
5. Technical Review	_____	_____
6. Editing	_____	_____
7. Team Leader Clearance	_____	_____
8. Final Typing	_____	_____
9. Editorial Proofing and Assembly	_____	_____

Comments:

The steps on the cover sheet are explained as follows:

1. Author submits first draft to typist.
2. Initial typing completed and returned to author (no copies).
3. Author (and/or Work Group Leader*)reviews typed draft for completeness and accuracy. Minor changes such as simple word additions, word deletions, or sequence changes, are made in pen and on inserts. Retyping is done only when major changes, which cause difficulty in reading, are made. When the draft is ready for technical review, the draft is returned to the typist for copies, filing, and routing.

4. Typist makes and disseminates copies to (1) author, (2) work group leader*, (3) file, and (4) Technical Coordinator. Copies are not made before this step. Also, other authors needing to see the draft should check out the file copy rather than requesting additional copies. There is not need for author (or Work Group Leader*) to see the copy which goes to the Technical Coordinator because any changes should have taken place in Step 3.
5. Technical Coordinator reviews and resolves all conflicts with Work Group Leader*, author, Editor, and Team Leader. Agreement is reached on all changes to be made. Minor changes are made in pen and on inserts. Retyping (and copies) is done for major changes only. All changes are cleared through author and/or Work Group Leader* before giving to Editor.
6. Editor edits and resolves all conflicts with Work Group Leader*, author, Technical Coordinator, and Team Leader. Agreement is made on all changes to be made. Minor changes are made in pen and on inserts. Retyping is done for major changes only. All changes are cleared through author and/or Work Group Leader* before giving to Team Leader for final clearance.
7. Team Leader assumes that <u>all</u> conflicts have been resolved in each previous step. Any final editing problems are resolved with the Editor. Any final coordination problems are resolved with the Technical Coordinator. Steps 5 and 6 would then be repeated. After approval, the draft is submitted for final typing.
8. Final typing is completed (it is usually only at this point that mag cards are used), and the draft is returned to the Editor.
9. Editorial proofing, retyping, and assembly. Any last minute changes, beyond minor typographical errors, misspellings, etc., are shown to the author if time permits, or approved by the Team Leader.

*Larger, more complex EIS projects may require Work Group Leaders who are responsible for several specialists working in the same or similar specialties.

Technical Coordinator

The Technical Coordinator maintains and enforces a deadline schedule, reviews the draft for technical adequacy, and resolves all conflicts. The Technical Coordinator sees that the draft is understandable, checks for adequacy in terms of interdisciplinary approaches, assures that each section is coordinated with others, assures adherence to guidelines, assures that all analyses are sound and based on the same assumptions, and makes initial approval or rejection of maps, figures, and tables.

The major points which should be considered while reviewing an EA are as follows:

1. Will it be understandable to the average reader of, for example, a newspaper, Field and Stream, or Reader's Digest?
2. Does it contain value judgments, or does it philosophize?
3. It is crusading, or biased, or does it try to justify a particular point of view?
4. It is consistent with the facts, and with other portions of the EA?
5. Is it repetitious?
6. Is it properly cited and are references correct? Are analyses and conclusions of other sources properly cited? (All uncited analyses and conclusions are assumed to be those of the Specialist.)
7. Is detailed data placed in the appendix, or is it unnecessarily in the text? Is it necessary to include it in either place, or should it be referenced instead?
8. Does the Description of the Environment chapter describe today's and the future conditions, or does it regress into an unnecessary history of the area? Does the description overemphasize unnecessary points which would not even be impacted?

9. Does author really say what he means to say? Are authors' analyses sound and based on facts? Are assumptions stated? Do all authors use the same assumptions? Did author discuss all realistic possibilities and arrive at professional conclusions?
10. Is all information placed in the proper chapter:
11. Is the writing style similar throughout, and does all material conform to the prescribed format?

Editor

The Editor briefs all authors on styles and formats prior to the drafting stage, but in spite of these guidelines, most authors tend to use techniques and habits which may not be consistent with the goals of the EA. The Editor now is responsible for consistency of style, format, logic, and readability.

Editors would usually be involved only in mechanical or copy editing. This would involve paying close attention to every detail in the manuscript, such as checking for capitalization, spelling, hyphenation, agreement of verbs and subjects, quotation marks, parentheses, number of ellipsis points, words or figures for numbers, sentence structure, redundancy, and many other details of style, format, and printing preparation. The Editor would then provide liaison between the author, Work Group Leader, Technical Coordinator, Cartographer, and printers. If this were the case, the Editor would not be involved in editing for technical adequacy, and there would be no need for the Editor to return the draft to the author, Work Group Leader, or Technical Coordinator, except in cases where potentially sensitive meaning changes would occur.

Realistically, however, in addition to the above, the Editor becomes involved in technical review and substantive editing. This includes writing; rewriting; reorganizing; finding more efficient and readable

methods of presentation; double checking for consistency, adequacy, and compliance with guidelines; finalizing cartographic assignments; preparing the table of contents; and assisting in preparing the summary. Therefore, the Editor works in conjunction with the Technical Coordinator, Team Leader, Work Group Leader, and authors.

PRINTING

Usually the Environmental or Technical Coordinator, the Editor, or the Public Affairs Officer will make final layout and printing arrangements (see 314.DM1.5, BLM 1511.11F, and Government Printing and Binding Regulations, October 74, #23). However, it is also desirable that the entire team, and certainly the Cartographer, at least be aware of certain items which must be resolved before printing time.

As mentioned in the style and format section, rather than placing unnecessary constraints on color, foldouts, figures, volume size, etc., it should first be decided what is needed. All efforts should be made to remain within General Services Administration (GSA) or Government Printing Office (GPO) printing capabilities, but on more complicated EAs, local printers can assist in preparing for the most efficient and most desirable printing. They can also be conferred with on a daily basis to make suggestions or to answer questions.

Illustrations, and other graphics, need not be completely uninteresting. Colored paper, chapter dividers, variations in lettering, etc., can make an EA simple yet attractive. However, an EA should not be so attractive that the public or the applicant would criticize an unnecessary use of funds. No more "dressing up" of the document should be done than is necessary to make the document clearly portray the situation in an attractive, clear, and readable format. The Branch of Environmental Assessment has developed a standard cover which avoids bias and reduces expenses and preparation time.

Printing usually takes between ten days and six weeks. Six weeks is most likely if color is used. If printing is done by GPO, the final EA normally must be submitted all at once. If time is critical, non-government printers can accept one chapter at a time, submitted as completed, which might speed up the printing process or allow for additional wirting time on certain chapters.

Request printing in advance. Check with the GSA printer first. If they cannot meet the demands, check with GPO in Seattle. If GPO cannot meet the demands, they will waive government printing and accept bids from outside printers who can meet the required specifications.

If it is desirable to confer with a local printer during the planning process, that printer may arrange to be on a GPO contract list. This will allow the printer to bid for the contract if the government cannot meet specifications.

The following questions should be kept in mind while establishing formats and needs:

1. Is color necessary? If it is desirable, authorization should be cleared early enough to coordinate preparation (see Appendix 3, Figure 2). There is now a blanket authorization for colored maps (up to five colors) in EISs. Color for more than maps requires individual clearances.
2. What size, texture, weight, and color of text paper will be best?
3. What size and color print, including labeling, will be best? Will print be typeset, or must all material be camera ready? What style of type should be used for final manuscript if it is to be camera ready?
4. What size and scale should be used for maps? Will the maps need to be folded?
5. What size should photographs be? Must they be glossy? Can color transparencies be efficiently and economically converted for black and white reproduction? Are excessive aerial photographs really helpful to the average public? How will "crop marks" be placed on the photographs, and who will do it?
6. What are general reduction and blow-up capabilities of most printers for tables, maps, and figures?

7. Is artwork desirable? Is there a contract for such work? Interior illustrations and photographs may be used without permission, but non-Interior illustrations cannot be used without permission and credit.
8. What types of binding will be used, and what will binding margin requirements be? (An inch and a half left margin will allow any type of binding.)
9. What will be the overall size of the printed document?
10. What visual aids will be desirable for public presentations and hearings? Assure early preparation by artists, photographers, cartographers, etc.
11. How many copies are anticipated?

REFERENCES

After reviewing a number of books on style, format, and grammar, several books were used in compiling this chapter. These included the U.S. Government Printing Office Style Manual, Wadsworth Publishing Company's Words and Ideas by Hans P. Guth, McGraw-Hill Book Company's Reference Manual for Stenographers and Typists, McGraw-Hill Book Company's Standard Handbook for Secretaries, University of Chicago Press's A Manual for Writers by Kate L. Turabian, and University of Chicago Press's A Manual of Style. If only one book could be in the EA editor's or writer's library, A Manual of Style seems to be the most appropriate. It provided many choices and answers, and it was the easiest to use.

(First page of chapters would not have running head.)

CHAPTER NUMBER

CHAPTER TITLE

.0 (optional)

.1 (Second section head would be 4.2)

SECTION HEAD

Chapter numbers, chapter titles, and section heads may be shown by centering, spacing, underlining, and capitalizing as shown above. Use arabic numbers for chapters, and begin six line spaces from the top. Chapter titles are underlined, are in all capitals, and are centered two line spaces below the chapter number. Each chapter is to begin on a right-hand (recto) page.

Each major section head (environmental components such as soils, water, wildlife, etc.) begins on a new page (except for the first section head under the chapter number and title, as shown above); is centered; is in all capitals; and begins six line spaces from the top (except for the first section under the chapter title, where it is four line spaces below the chapter title as shown above). During final typing, it is not essential that each environmental component begin on a new page if excessive space is taken up. However, be consistent one way or the other within the chapter.

Other pages not beginning with chapters or section heads have the first line beginning eight line spaces down (as shown on the next page). Within chapters, it is optional whether the word Introduction is used as a subhead (as in the case of this paragraph); however, if the word Introduction is desired, it is treated the same as below. The first paragraph of a chapter is not indented.

1.1 not decimals ond s nt)

First Subheading

First subheads are even with the left margin, have the first letter of each important word capitalized, are underlined, and are preceded by four line spaces and followed by two line spaces. The

(If this were page 1 of Chapter 3, page number would be:)

3-1

first sentence of a paragraph should not end a page, and the last sentence of a paragraph should not begin on a new page.

Second Subheading

Second subheads are the same as the first subhead, but are not underlined.

Third Subheading. Third subheads are preceded by only two line spaces and the text is followed by only two line spaces (unless followed by another second or first subhead); are indented five spaces (as are paragraphs); are underlined; have the first letter of each important word capitalized; and are followed by a period before beginning the first sentence of the paragraph on the same line.

No first sentences should contain a pronoun referring back to any subheading.

If a decimal numbering system is desired, the above system is still to be used. Simply place the decimal numbers (to the third level only) in the left margin to avoid cluttering the text.

An inch and a half left margin will allow any type of binding. An inch margin should be left on the bottom and right side.

Line spacing should be in even increments as shown by 2, 4, and 6 spaces (or preferably by 1-1/2, 3, and 4-1/2 spaces, to make the final 1-1/2 spaces) for ease of mag card operation.

Also see page 7, chapter 3, of this handbook, and A Manual of Style for placement of running heads in final manuscripts.

Several of many potential examples and explanations of various subheading choices within these guidelines are shown on the following pages. All examples should be read because other possibilities may be included under other environmental components.

ANIMALS

Elk

It is not usually necessary to use "Big Game" as a subheading before "Elk" and "Bear, and certainly not usually necessary to add further subheadings like "Mammals." Simply jump to the subject without interjecting unnecessary levels. This makes it easier for the reader to track what happens to "Deer" throughout all chapters. Also, it is usually not necessary to subdivide "Elk" into further subheadings like "Bulls" and "Cows"; and further into "Winter Range" and "Summer Range"; and further into "Populations" and "Food Habits", etc. Do write about all needed information, but use good transitions and topic sentences rather than so many subheadings.

Bear

Sage Grouse

Following the same explanation as under "Elk", it would seldom be necessary to interject "Birds", "Upland Birds", "Game Species", and "Grouse." Simply jump to the main subject of "Sage Grouse."

Sharptailed Grouse

Reptiles and Amphibians

Endangered Species

If there was only one endangered species, this subheading could be deleted. Simply jump directly from "Animals" to "Peregrine Falcon", and perhaps italicize *endangered species* when describing it.

Fish

If only one species of fish is to be discussed, "Rainbow Trout" could be substituted for "Fish."

Other Animals

(Also see next pages.)

ANIMALS

Big Game

It could be desirable to interject "Big Game" as a subheading, but only if a general discussion about requirements common to all big game was essential prior to discussing individual species. The same explanation would apply to interjecting "Upland Birds" or "Grouse" before "Sage Grouse."

Elk

"Elk" might need some further subheadings, but usually only if the further subdvisions were critical and lengthy. (Even then, a flowing narrative without subheadings is usually preferable.)

Deer

"Deer" might need some further subheadings, but usually only if critical and lengthy differences existed between, for example, white-tailed deer and mule deer.

Antelope

Bear

Black Bear. "Bear" might need some further subheadings, but usually this would require, for example, a critical difference between the grizzly bear and the black bear.

Grizzly Bear. It would not usually be necessary to use further subheadings for "Craighead Studies," "Human Deaths," etc. Try to write in a flowing narrative without subheadings.

WATER

Surface Water

It may often be desirable to subdivide "Water" into "Surface Water" and "Ground Water." However, it is not usually necessary to use further subheadings. Sediment leads, water quality, streams, and tributaries, etc., should be discussed if needed, but try to do so in one flowing narrative without subheadings.

Ground Water

WATER

Surface Water

Low Flow

Flood Flow

If essential, surface water might need subheadings of "Low Flow" and "Flood Flow." They could probably be written in one flowing narrative with good topic sentences, but if it is determined that they are critical, at least do not use further subheadings for "Frequency," "Duration," Chemical Analysis," etc. Discuss them as needed, but try to do so in a flowing narrative without so many subheadings.

Ground Water

Another way that the above could be done is shown below with colons:

WATER

SURFACE WATER: LOW FLOW

SURFACE WATER: FLOOD FLOW

GROUND WATER

WATER

Surface Water

Missouri River System

Yellowstone River.

Milk River.

Columbia River System

It might occasionally be necessary to use extra subheadings like the above, but usually only in something like a programmatic EIS. If further subheadings are essential, consider the example on the following page.

WATER

SURFACE WATER

Missouri River System: Streams

Yellowstone River.

Musselshell River.

Missouri Mainstem.

Missouri River System: Reservoirs

Bighorn Reservoir.

Tongue River Reservoir.

Fort Peck Reservoir.

Garrison Reservoir.

This is again an example for a programmatic EIS. Note the use of colons.

CHAPTER 4

MITIGATING OR ENHANCING MEASURES

WATER *(This would not actually be the first environmental component under the chapter title)*

Applicant's Commitments

Surface Water)
) *(or preferably surface and ground water can be covered together without using them as*
Ground Water) *subheadings.)*

Additional Enforceable Measures

Surface Water

Ground Water

Other Possible Measures

Surface Water

Ground Water

CHAPTER 3
ENVIRONMENTAL IMPACTS

CLIMATE

Another completely different possibility, especially in the case of a complex regional EIS, would be to have chapter titles hand-lettered in a bold face. This would allow the section heads, rather than the chapter title, to be underlined, thus allowing one more heading use.

APPENDIX TO SECTION 1

Public Law 91-190
91st Congress, S. 1075
January 1, 1970

An Act

83 STAT. 852

To establish a national policy for the environment, to provide for the establishment of a Council on Environmental Quality, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Environmental Policy Act of 1969". National Environmental Policy Act of 1969.

PURPOSE

SEC. 2. The purposes of this Act are: To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.

TITLE I

DECLARATION OF NATIONAL ENVIRONMENTAL POLICY

SEC. 101. (a) The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans. Policies and goals.

(b) In order to carry out the policy set forth in this Act, it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may—

(1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

(2) assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;

(3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;

(4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;

(5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and

(6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

(c) The Congress recognizes that each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment.

Administration.

SEC. 102. The Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the Federal Government shall—

(A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment;

(B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by title II of this Act, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations;

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on—

(i) the environmental impact of the proposed action,

(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,

(iii) alternatives to the proposed action,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by section 552 of title 5, United States Code, and shall accompany the proposal through the existing agency review processes;

Copies of statements, etc.; availability.

81 Stat. 54.

(D) study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;

(E) recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment;

(F) make available to States, counties, municipalities, institutions, and individuals, advice and information useful in restoring, maintaining, and enhancing the quality of the environment;

(G) initiate and utilize ecological information in the planning and development of resource-oriented projects; and

(H) assist the Council on Environmental Quality established by title II of this Act.

Review. SEC. 103. All agencies of the Federal Government shall review their present statutory authority, administrative regulations, and current policies and procedures for the purpose of determining whether there are any deficiencies or inconsistencies therein which prohibit full compliance with the purposes and provisions of this Act and shall propose to the President not later than July 1, 1971, such measures as may be necessary to bring their authority and policies into conformity with the intent, purposes, and procedures set forth in this Act.

SEC. 104. Nothing in Section 102 or 103 shall in any way affect the specific statutory obligations of any Federal agency (1) to comply with criteria or standards of environmental quality, (2) to coordinate or consult with any other Federal or State agency, or (3) to act, or refrain from acting contingent upon the recommendations or certification of any other Federal or State agency.

SEC. 105. The policies and goals set forth in this Act are supplementary to those set forth in existing authorizations of Federal agencies.

TITLE II

COUNCIL ON ENVIRONMENTAL QUALITY

Report to Congress. SEC. 201. The President shall transmit to the Congress annually beginning July 1, 1970, an Environmental Quality Report (hereinafter referred to as the "report") which shall set forth (1) the status and condition of the major natural, manmade, or altered environmental classes of the Nation, including, but not limited to, the air, the aquatic, including marine, estuarine, and fresh water, and the terrestrial environment, including, but not limited to, the forest, dryland, wetland, range, urban, suburban, and rural environment; (2) current and foreseeable trends in the quality, management and utilization of such environments and the effects of those trends on the social, economic, and other requirements of the Nation; (3) the adequacy of available natural resources for fulfilling human and economic requirements of the Nation in the light of expected population pressures; (4) a review of the programs and activities (including regulatory activities) of the Federal Government, the State and local governments, and nongovernmental entities or individuals, with particular reference to their effect on the environment and on the conservation, development and utilization of natural resources; and (5) a program for remedying the deficiencies of existing programs and activities, together with recommendations for legislation.

Council on Environmental Quality. SEC. 202. There is created in the Executive Office of the President a Council on Environmental Quality (hereinafter referred to as the "Council"). The Council shall be composed of three members who shall be appointed by the President to serve at his pleasure, by and with the advice and consent of the Senate. The President shall designate one of the members of the Council to serve as Chairman. Each member shall be a person who, as a result of his training, experience, and attainments, is exceptionally well qualified to analyze and interpret environmental trends and information of all kinds; to appraise programs and activities of the Federal Government in the light of the policy set forth in title I of this Act; to be conscious of and responsive to the scientific, economic, social, esthetic, and cultural needs and interests of the Nation; and to formulate and recommend national policies to promote the improvement of the quality of the environment.

SEC. 203. The Council may employ such officers and employees as may be necessary to carry out its functions under this Act. In addition, the Council may employ and fix the compensation of such experts and consultants as may be necessary for the carrying out of its functions under this Act, in accordance with section 3109 of title 5, United States Code (but without regard to the last sentence thereof).

80 Stat. 416.

Duties and functions.

SEC. 204. It shall be the duty and function of the Council—

(1) to assist and advise the President in the preparation of the Environmental Quality Report required by section 201;

(2) to gather timely and authoritative information concerning the conditions and trends in the quality of the environment both current and prospective, to analyze and interpret such information for the purpose of determining whether such conditions and trends are interfering, or are likely to interfere, with the achievement of the policy set forth in title I of this Act, and to compile and submit to the President studies relating to such conditions and trends;

(3) to review and appraise the various programs and activities of the Federal Government in the light of the policy set forth in title I of this Act for the purpose of determining the extent to which such programs and activities are contributing to the achievement of such policy, and to make recommendations to the President with respect thereto;

(4) to develop and recommend to the President national policies to foster and promote the improvement of environmental quality to meet the conservation, social, economic, health, and other requirements and goals of the Nation;

(5) to conduct investigations, studies, surveys, research, and analyses relating to ecological systems and environmental quality;

(6) to document and define changes in the natural environment, including the plant and animal systems, and to accumulate necessary data and other information for a continuing analysis of these changes or trends and an interpretation of their underlying causes;

(7) to report at least once each year to the President on the state and condition of the environment; and

(8) to make and furnish such studies, reports thereon, and recommendations with respect to matters of policy and legislation as the President may request.

SEC. 205. In exercising its powers, functions, and duties under this Act, the Council shall—

(1) consult with the Citizens' Advisory Committee on Environmental Quality established by Executive Order numbered 11472, dated May 29, 1969, and with such representatives of science, industry, agriculture, labor, conservation organizations, State and local governments and other groups, as it deems advisable; and

34 F. R. 8693.

(2) utilize, to the fullest extent possible, the services, facilities, and information (including statistical information) of public and private agencies and organizations, and individuals, in order that duplication of effort and expense may be avoided, thus assuring that the Council's activities will not unnecessarily overlap or conflict with similar activities authorized by law and performed by established agencies.

SEC. 206. Members of the Council shall serve full time and the Chairman of the Council shall be compensated at the rate provided for Level II of the Executive Schedule Pay Rates (5 U.S.C. 5313). The other members of the Council shall be compensated at the rate provided for Level IV or the Executive Schedule Pay Rates (5 U.S.C. 5315). Tenure and compensation. 80 Stat. 460, 461. 81 Stat. 638.

SEC. 207. There are authorized to be appropriated to carry out the provisions of this Act not to exceed $300,000 for fiscal year 1970, $700,000 for fiscal year 1971, and $1,000,000 for each fiscal year thereafter. Appropriations.

Approved January 1, 1970.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 91-378, 91-378, pt. 2, accompanying H. R. 12549 (Comm. on Merchant Marine & Fisheries) and 91-765 (Comm. of Conference).
SENATE REPORT No. 91-296 (Comm. on Interior & Insular Affairs).
CONGRESSIONAL RECORD, Vol. 115 (1969):
July 10: Considered and passed Senate.
Sept.23: Considered and passed House, amended, in lieu of H. R. 12549.
Oct. 8: Senate disagreed to House amendments; agreed to conference.
Dec. 20: Senate agreed to conference report.
Dec. 22: House agreed to conference report.

APPENDIX TO SECTION 2

ALTERNATIVES TO THE PROPOSED ACTION

These are major alternate courses of action available to the decision-maker to meet the basic objective of the proposed action. They must be analyzed in sufficient detail to provide the decisionmaker with an adequate understanding of the implications of all major options open to him.

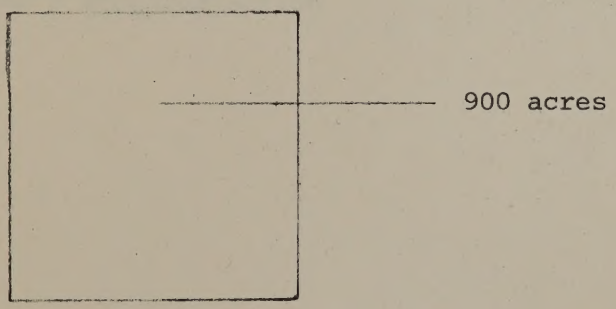
For example, the objective of a 900 acre lease application is to mine 900 acres of coal for energy production and consumtpion. A major BLM resource management objective is "making coal available to meet national energy needs in an environmentally sound manner." It may be that only a 600 acre lease offering is possible in the application area if mining is to occur in an environmentally sound manner. The 600 acre offering is an alternative to the proposed action available to BLM and consistent both with its jurisdiction and management policies. It is one with which the district manager must examine, and should be treated. Obviously, an alternative must be as responsive as possible to a specific project objective, while remaining consistent with BLM overriding resource policies.

Alternatives do not have to be within the jurisdiction of BLM. An alternate right-of-way to an application to cross BLM land may be well the best routing. The BLM decisionmaker must know this in order to make a wise decision whether to approve the BLM right-of-way.

Example: THE EVER PRESENT DILLEMMA

Take the above example of a 900 acre lease application before BLM. In light of BLM's basic resource management objectives, and its jurisdictional options, this proposed action could be treated in an EAR or EIS in at least three different ways:

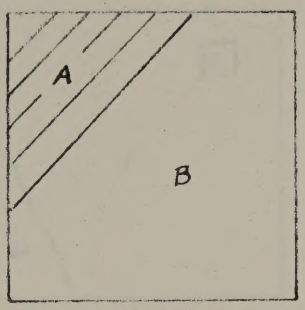
COMPANY X LEASE APPLICATION



APPENDIX 2, FIGURE 1

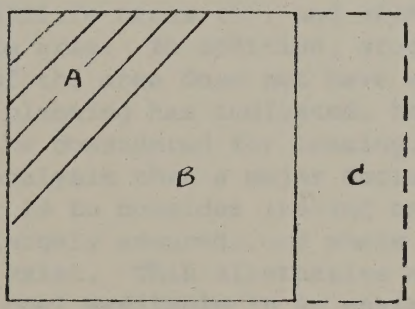
1. The Modified Proposed Action Approach

The proposed action before the Bureau of Land Management is the leasing of 900 acres. However, the management framework plan has determined 200 acres (A) to be critical habitat for a threatened species and unsuitable for mining. This should be reflected in the introduction to the EIS/EAR, and the proposed action for analysis would be the leasing of 700 acres (B). There is no sense analyzing further an action where a constraining management decision has already been made.



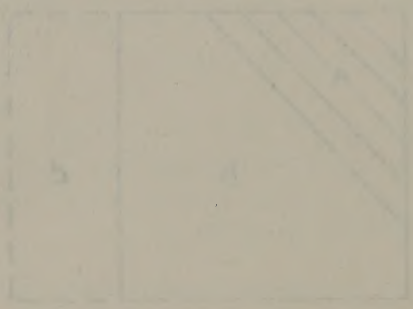
B = EIS/EAR Proposed Action

If a 1,100 acre logical mining (LMU) determination had been made in this area, making it inappropriate to lease in a smaller acreage, the same rationale would apply to analyzing the lease of the larger acreage.



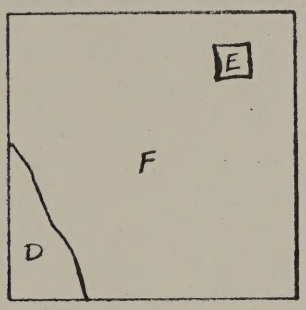
B+C = Proposed action

APPENDIX 2, FIGURE 1



2. The Mitigating Measure Example

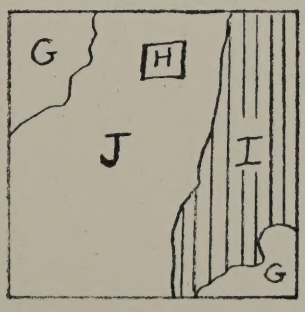
Several very important hardwood draw/wildlife habitat areas (D) exist within the 900 acres, along with a fairly important archaeological site (E). Destruction of these represent the major residual adverse impacts should the entire area be leased and mined. Exclusion of these areas, totalling 80 acres could be treated as mitigating measures.



E+D = mitigation by selective exclusion (denial) from area offered for lease

3. Alternatives to the Proposed Action Approach

Several important wildlife areas (G), and archaeologic site (H), exist in the proposed lease area. In addition, studies and BLM planning have indicated that 20% of the area does not have adequate reclamation potential (I). BLM planning has indicated, however, that the overall area would at least be considered for leasing. It becomes obvious during the EIS/EAR analysis that a major decision likely to face the BLM district manager is to consider leasing only in those areas where reclamation can be largely assured, and where sensitive wildlife and archaeologic values exist. This alternative would meet the basic objective of making coal available in an environmentally sound manner. Leasing only coal in Area J (400 acres) is different enough from the project objective that it would have to be treated as an alternative Bureau motion action, not as a series of mitigating measures.



J = Alternative to the proposed action

APPENDIX 2, FIGURE 1

There are no formulas to determine how best to address an action in terms of the above three options. A major objective should be how to express and analyze the major options available for consideration by the decisionmaker and public.

Obviously, every possible option, whether alternative or mitigation, cannot be examined in an EAR/EIS. The EAR/EIS is not meant to take the place of a manager examining the analysis and using his best judgement in selecting a decision mix not specifically outlined as a proposed action or alternative in the EAR/EIS.

ENVIRONMENTAL COMPONENTS

ENVIRONMENTAL COMPONENTS

The following fifteen environmental components are to be considered as the basic units in the analysis process.

CLIMATE
AIR QUALITY
GEOLOGY
TOPOGRAPHY
SOILS
WATER
VEGETATION
ANIMALS
PREHISTORIC AND HISTORIC FEATURES
AESTHETICS
RECREATION
SOCIAL CONDITIONS
ECONOMIC CONDITIONS
LAND USE
ECOLOGY

The selection of these components has developed out of experience with the Environmental Digest (Appendix 2 of BLM Manual 1791), which is an optional guideline for the environmental analysis process. The objective of using environmental components is to prepare an analysis relevant to understanding the impacts of the proposed action. The component headings "Nonliving", "Living", "Ecological Interrelationships", and "Human Values" are not used. In analyzing some proposals, fewer than fifteen environmental components may be employed. The individual responsible for preparing the analysis may consider the use of any component as optional. One component that is particularly susceptible to optional status is ecology.

To assist the users of this guidance in preparing analysis, the environmental components have been described generally by primary characteristics and change agents.

ENVIRONMENTAL COMPONENT: CLIMATE

PRIMARY CHARACTERISTICS

Prevailing wind direction and velocity, inversion tendencies, vertical movements, variation of temperature, frost-free days, and amounts of precipitation by month or season.

CHANGE AGENTS

Topography, continental location, urban buildup areas, vegetal cover, natural climatic factors, and man-made heat generating source.

ENVIRONMENTAL COMPONENT: AIR QUALITY

PRIMARY CHARACTERISTICS

Levels of concentration persistence, and extent of materials including gases, solids, liquids, radiant energy, and electromagnetic energy.

CHANGE AGENTS

Natural factors of wind patterns, rainfall, topography, and inversion areas.

Man-made factors of combustion sources, wind erosion areas, wildfires, construction sites, and type of radiation sources.

ENVIRONMENTAL COMPONENT: GEOLOGY

PRIMARY CHARACTERISTICS

Stratigraphy, structural geology, minerals, glaciation, and fossils. The geologic component of the environment is unique in that the rocks are relatively unchanging. When geologic forces exert themselves (rarely) the results are apt to be catastrophic in terms. Landslides, earthquakes, and cave-ins are typical.

CHANGE AGENTS

Natural change agents are those whose effects will vary with the specific types of rock attack, depend on weathering, plant and animal activity, and tectonic activity. Weathering involves physical and chemical erosion as well as degradation and precipitation of the removed materials. Plant and animal activity is limited primarily to the earth surface and the soil zones. Tectonic or mountain building activity is manifested by earthquakes, uplifts, and subsidence.

Man's activities as a geologic change agent are largely confined to the thin zone which he can dig, build, or blast. These activities include mining, extraction of fluids--oil, gas, and water--contamination by disposal of refuse, and construction--of roads, dams, lakes, buildings, cities, canals, harbors, and like.

ENVIRONMENTAL COMPONENT: TOPOGRAPHY

PRIMARY CHARACTERISTICS

Topography is the surface configuration of the earth. Like the geologic units on which it is carved, it is a relatively passive component of the environment. Characteristics include:

1. Relief - vertical distance between high and low areas
2. Slope - whether steep or gentle, regular, or interrupted
3. The surface drainage pattern - intricate or widely spaced, dendritic, trellis, radial, or mixed
4. Orientation of slope

CHANGE AGENTS

Natural change agents are weathering, plant and animal activity and tectonic activity. Weathering involves physical and chemical erosion as well as degradation and precipitation of the removed materials. Plant and animal activity is limited primarily to the earth surface and the soil zones. Tectonic or mountain building activity is manifested by earthquakes, uplifts, and subsidence.

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ENVIRONMENTAL COMPONENT: SOILS

PRIMARY CHARACTERISTICS

Particle size, porosity, compactness, temperature, water, and air holding capacity, etc., types of nutrients, level of concentration, areal location, chemical availability, etc., type of pollutants, micro-organisms, areal extent, level of concentration, persistence in relation to ground water, type of erosion, quantity and quality of soil loss, and location and extent of eroded areas.

CHANGE AGENTS

Natural change agents predominantly are weather, plants, and animals. Rain, snow, and wind all work to change, erode, transport, and deposit soil materials. Plants not only remove nutrients but they also modify soil structure, make soil more cohesive, add humus to the soil, and reduce soil temperature by shading. Animals both mix and compact the soil, add organic materials, and modify the soil texture and structure.

Man's activities to change the soil characteristics are varied. They include depletion of fertility, increase of fertility, change of plant and animal communities in and on the soil, removal and replacement of soils in specific areas, burial of soils by asphalt, concrete, and buildings, change of surface water runoff patterns and erosion patterns, and contamination of the soil by deposition of waste materials.

Soils is one of the most critical components of the environment in terms of productivity and sustenance of life. The soil is derived from rock (either native or deposited by wind, water, or glaciers) and modified by plants and animals.

ENVIRONMENTAL COMPONENT: WATER

PRIMARY CHARACTERISTICS

1. Hydrologic cycle--natural or modified paths of water in local area from precipitation to discharge.

2. Availability and location of supply--streams, lakes/ponds, and ground water (in terms of volumes, fluctuations, yields, and area).

3. Chemical quality--dissolved solids, pH, and dissolved oxygen (including common constituents, nutrients, radiological content, toxic elements, and heavy metals).

4. Physical quality--temperature, bacterial load, and sediment load (bed, suspended, and floating).

CHANGE AGENTS

Natural changes in the physical and biological environment alter the primary characteristics of the water supply. Climatic fluctuations will modify the patterns of precipitation and hence change the timing and amounts of available water. Change in vegetative patterns and animal populations will affect both physical and chemical quality of the water and several parts of the hydrologic cycle. Man's activities also are change agents that affect the water resource. Specific activities include soil disturbance, vegetation alteration, dam construction, irrigation, stream alteration and dredging, dumping of industrial/agricultural/municipal effluents, excessive withdrawals, road and municipal development, and misuse of agricultural chemicals. The influence of specific human activities may affect several of the primary characteristics of water.

ENVIRONMENTAL COMPONENT: VEGETATION

PRIMARY CHARACTERISTICS

Species, density, distribution, vigor, population trends, rare or endangeres status, physiological requirements, phreatophytic tendency, and light and temperature requirements.

The characteristics may be applied to various broad classes of vegetation:

Agricultural - cropland, pasture/hayland, orchards, groves

Rangeland - grassland, annuals, wooded draws, desert shrub

Forest/Woodlands - evergreen, deciduous, mixed

Water/Aquatic - streams and waterways, lakes, reservoirs, other

Wetlands - vegetated marshes or meadows

CHANGE AGENTS

Natural forces of temperature, precipitation, light, nutrients, exposure, elevation, competition, plant disease, animal use, fire, etc., as well as human use and influence on these natural factors.

ENVIRONMENTAL COMPONENT: ANIMALS

PRIMARY CHARACTERISTICS

Species, density, age distribution, rare and endangered status, natality, mortality, genetic bank, distribution, vigor, trends, migration habits, mating habits, cover requirements, physiological requirements, etc.

For some purposes in the environmental analysis, species of animals may be placed in broad groups based on certain criteria; for example:

Big Game
Game Birds and Waterfowl
Furbearers and Predators
Small Mammals
Raptors
Other Non-game Birds
Reptiles and Amphibians
Fish
Invertebrates
Threatened and Endangered Species

CHANGE AGENTS

Natural factors of predation, competitive cover, water and food availability, disease, fire, as well as human influence on these natural factors, plus trapping, hunting, and eradication efforts.

For selected species, generalized distribution maps may be developed showing which portions of the study area are considered to be good, fair, poor, or non-habitat. Narratives to accompany the maps could summarize the status of each species considering management problems and prospects, habitat requirements, and probable future population trends.

ENVIRONMENTAL COMPONENT: PREHISTORIC AND HISTORIC FEATURES

PRIMARY CHARACTERISTICS

The resource consists of prehistory and history. Both parts exist in the form of objects in or on the ground, although the objects differ according to part. Prehistoric objects include those things made or modified by man and for which no written records are available--for example, projectile points, other stone tools, fire hearths, habitation structures, religious shrines, etc.--and generally this implies that the objects were placed before written history. Historic objects are also man-made or modified, but are from the time period when written history is available (for example, tools, machinery, and structures in a mining ghost town).

There is a second, more important, aspect to the resource. These objects all occur in a context. They are spatially related to each other and to components in their environment. It is this quality of the resource that allows interpretation of the living habits of the people that left the objects behind.

CHANGE AGENTS

Any agency, natural or human-implemented, which disturbs the ground surface, will change the nature of this resource, i.e., will destroy its integrity. Since the interpretation of the objects of prehistory and history depend on their contextual arrangement, ground disturbance (by altering the arrangement) causes immeasurable loss of information.

ENVIRONMENTAL COMPONENT: AESTHETICS

PRIMARY CHARACTERISTICS

Deals with how man perceives his environment through the senses of sight, sound, smell, taste, or touch. Emphasis is placed on visual, sound, and odor considerations. Analysis of the visual resource includes the identification of visual quality objectives and a treatment of project contrasts and its relationship to line, form, color, and texture. Sound includes duration and intensity (level) and can be related to both people and wildlife.

CHANGE AGENTS

Any action that would alter the visual, sound, or odor characteristics of the landscape including nearly all land management practices. Major change agents are those which modify the line, form, color, and texture of the landscape features of land and water surface (movement of soil, modification of skyline, etc.), vegetation (removal or change or type of mix of types), and the placement of structures or man-made features. Sound can be changed by construction activities (machinery, blasting, etc.), operation, increased traffic, or transport of material, etc. Change agents for odor might include release of gases, storage of waste materials, etc.

ENVIRONMENTAL COMPONENT: RECREATION

PRIMARY CHARACTERISTICS

Includes all human leisure pursuits and values, opportunities available, and existing uses. Recreation is any form of leisure-time activity or experience in which an individual engages from choice because of the enjoyment and satisfication which it brings to him directly.

CHANGE AGENTS

Potential change agents include population growth, increases in income and available free time, changing attitudes or technology, and changes in the natural environment which affect enjoyment or satisfaction (noise, adverse visual impacts, access, etc.)

ENVIRONMENTAL COMPONENT: SOCIAL CONDITIONS

PRIMARY CHARACTERISTICS

Human behavior (past, present, potential) in the use (exploitation of economic, cultural, and educational opportunities) of natural and human resources. The differential effects of these resource uses on persons identified with various collectivities (social classes, occupational groups, sub-cultures, general public, etc.)

Present sentiment (expressed and/or unexpressed) toward the use (present, potential) of resources. Variation in sentiment among persons in different collectivities.

Analysis includes both quantitative and qualitative procedures.

CHANGE AGENCY

Resource availabilities affect human behavior (population change, political involvement, leisure pursuits, development of governmental structures, etc.). Human sentiment affects resource uses (type, rate, location, stipulations, etc.). Behaviour and sentiment are generally consistent unless prohibiting external conditions (permits, laws, regulations, etc.) exist.

ENVIRONMENTAL COMPONENT: ECONOMIC CONDITIONS

PRIMARY CHARACTERISTICS

Identification of the causes for change in an economy. This would include things which would affect the level of employment (total and by sector), wages/salaries paid to employees, capital investment, demand for goods and services caused by population changes, etc.

Once the change agents have been identified (see below), determine the magnitude of changes expected to occur with reference to employment, earnings, etc. For example, coal mining activity (the change agent) will lead to a greater payroll in the impacted area. The coal workers will spend their payroll on a variety of goods and services in the community (housing, clothing, etc.) which will stimulate the local economy.

The analysis should be done in such a way that the impact resulting from the change agent's action is isolated from other "business as usual" actions. In order to do this, it is often necessary to make assumptions about the current and future economic character of the area in question. For example, one might assume that the housing industry in a given area would have grown at a rate comparable to its annual growth rate during the last five years. We would now be able to estimate the impacts upon housing in the affected area from coal developments.

CHANGE AGENTS

Entities or actions which will influence the general economic character of an area. Actions and/or interactions of public and private sector which will result in changes in employment, income, investment, population, and demand and supply of goods and services, to name a few. The change agent can be local, regional, national, or international.

ENVIRONMENTAL COMPONENT: LAND USE

The primary purpose of analyzing the land use component is to consider major land uses and land use patterns and trends in terms of their competition with one another, their conflicts, suitability factors for land use, and land use implications for all other environmental components. This includes translating predicted transportation needs into potential land use patterns.

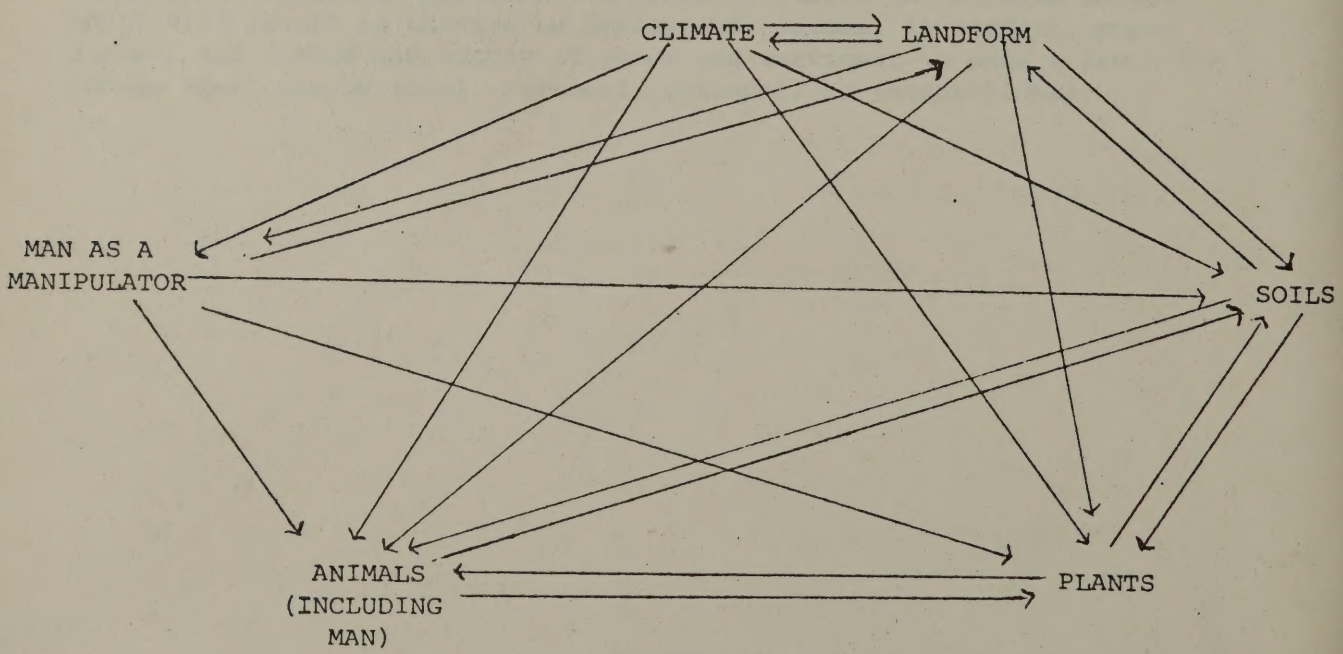
Topic areas within the land use component include current and predicted land uses. The broad categories of use based on U.S. Geological Survey land use and land cover classification would include: urban or built-up land, agricultural land, range land, forest land, water, wetlands, barren lands, tundra, and perennial snow or ice.

ENVIRONMENTAL COMPONENT: ECOLOGY

The use of this component is generally optional in that the characteristics and change agents often attributed to ecology are more effectively described under other specific environmental components (such as vegetation, water, animals, etc.).

If ecology as a component is to be carried throughout the chapters of an environmental analysis, any one of a variety of ecological classification systems based on landform, vegetation or landtype may be used. One example is the use of Ecological Land Units (ELU).

ELUs are geographic areas which are separated and named according to landform and vegetation. Each ELU has individual elements (landform, vegetation, soils, water, wildlife and human values) which differentiate it from other ELUs. Furthermore, each ELU has its particular degree of interdependence of the natural elements within the ELU. This relationship is represented by the following diagram.



Each Ecological Land Unit has a relationship between living and non-living components in which each is influenced to some degree by the others.

In preparing Environmental Analysis, the U.S. Forest Service uses ELUs for classifying ecosystems into subdivisions for forest description and management. The following are two examples of ELUs which are markedly different. The ELU titles which are based on landform and vegetation are given as: (1) Broad Alluvial and Colluvial Flat to Gently Sloping Plains and (2) Gently Sloping Forested Valley Sideslopes.

ELU Example 1

Broad Alluvial and Colluvial Flat to Gently Sloping Plains

Landform

The landform in this land type is of gently sloping uplands with slope averaging 8 to 30% and formed by alluvial and colluvial action from the steeper mountainous uplands. This material is either washed into place or slide during mud and rock flows. Much of this area is alluvium which overlays old river terraces. The vegetation on these land types is basically grassland or open ponderosa pine habitat types. These are quite dry and droughty. Portions of this land unit are moderately dissected by erosion which took place after the material was originally laid in place. There are often well defined stream channels present in the drainage pattern.

Climate and Hydrology

The precipitation on this land type ranges from 10 to 12 inches of which most comes as rainfall during late spring and summer storms. This is a very arid area and what snowfall that does fall is lost on the warm winter days to evaporation. Some of the rainfall comes during "intense summer thunderstorms" and the soils being unable to absorb the moisture

fast enough has some surface erosion occurring at intervals. The elevation ranges from 4,000 to 4,500 feet and the aspect is to the south and southwest. This land type contributes very little to the regulation or addition to the ground water supply and has very little or no runoff occurring.

Soils

The soil in this zone is very deep (50+ inches) and composed of loam to sandy loam soil which has 0 to 25% stone content in the surface foot of soil. The soil profile tends to be quite well developed with the stone content through the entire profile being 25 to 50%, with most occurring at fairly deep depths and this material is cobble sized. The soil is dry most of the year and is quite permeable with a low water holding capacity with the sandy texture of the soil.

Geology

The bedrock underlying this land type is very difficult to determine due to the deep beds of soil overlying the bedrock, but in some locations it was possible to determine the general makeup as sandstone and mudstone. The overlying material is alluvial or colluvial which has been eroded at later times after deposition.

Vegetation

The vegetation on this land type is basically dry grassland with Idaho fescue and wheatgrass being the primary species. Also, sagebrush is a prominent feature. In the forested areas, the habitat types are basically ponderosa pine/wheatgrass and some ponderosa pine/bitterbrush. These are low production timber sites.

Limitations and Potentials

This area has low timber production potential but the grazing forage potential is high for both livestock and big game. The possibility of conflict between domestic livestock and wildlife is highly probable. Any timber harvest should be done on a selective harvest or shelterwood cuttings. This area is fairly easily operated on with equipment.

ELU Example 2

Gently Sloping Forested Valley Sideslopes

Landform

This landform is that of a gently sloping forested valley side-slopes, when the slope ranges from 0 to 40%. The forest cover is generally quite heavy and supports good stands of timber. There are a few well defined drainageways in this land type. The soil is intensively frost churned. The slopes are convex in shape.

Climate and Hydrology

The precipitation on this land unit comes mostly as snow with the precipitation ranging from 20 to 25 inches. The growing seasons are fairly long in length ranging from 80 to 100 days. The elevation varies from 6,000 to 7,500 feet. Snow cover is usually continuous from late November to late April.

The runoff occurs as subsurface flow and there are many springs, seeps, and also weakly entrenched streams which contribute to stabilization of the streamflow and extending runoff into the summer months.

Soils

The soils are fairly deep (60+ inches) and are of a dark loamy to sandy loam soils. Surface stone content is 25 to 50% of gravel to cobble sized stone. The soil has moderate permeability and a moderate water holding capacity. The soil is a shale to gravel texture.

Geology

The bedrock is in the Belt Group and is primarily of the Newlan limestone formation. The bedrock is moderately hard and is medium in structure. Rock outcrop is only a minor feature in this unit. The bedrock is frost churned and well fractured. It is difficult to determine the dip and strike due to the deep soil mantle.

Vegetation

The vegetation in this unit is dominantly of the Douglas-fir habitat type, Douglas-fir/pinegrass (75%), Douglas-fir/spiraea (20%), and Douglas-fir/wheatgrass (5%). Lodgepole pine and Douglas-fir are the main overstory species. These have been maintained in the past by wildfire which periodically renewed the forest stand.

Potentials and Limitations

This is a good timber management site. No major limitations are present, which would limit use of this land type, except possibly erosion during peak runoff periods or during intense summer storms.

This is also used by wildlife for spring, summer, and fall range as cover and protection areas. Also supports some limited livestock grazing following timber harvest. This land unit also has the potential of recreation development. As the slopes are gentle, with well drained soils and available water which can be developed.

ANALYSIS FORMS

APPENDIX 2, FIGURE 3

ENVIRONMENTAL ANALYSIS RECORD ROSTER

State ___ District ___ FY ___

REGISTRY NUMBER	PROPOSED ACTION	NAME OF EAR	DATE APPROVED	ACTIVITY RECOMMENDING ACTION	DATE PROGRESS REPORTED	EAR RETRIEVAL LOCATION	NO. OF PAGES

ENVIRONMENTAL ANALYSIS STATUS CHART

Title	Originator-Date	Type	Estimated Draft Completion Date	Review & Comments Suspence Date	Estimated Completion Date	Actual Completion Date	Composer	Remarks/Priority/ Staff Specialists Assigned etc.

ENVIRONMENTAL IMPACT ANALYSIS

EXAMPLE

1. Description of the proposal

   Coal Strip Mine

2. Stages in proposal (optional)

   Mining

3. Agents that cause change

4. Environmental Components

Recreation

5. Subcomponents Impacted	Soil Removal	Soil Hauling	Stockpiling	Equip. Operation	Overburden Rem.			Change in Work Force	Change in Numbers	Change in Attitudes	Change in Earnings
6. Anticipated Impacts											
Outdoor Recreation Activities											
Hunting	X	X	X	X	-			X	X	X	
Fishing	X	-	-	-	-			X	X	X	
Camping	X	X	-	X	-			X	X	X	
Hiking	X	X	-	X	-			X	X	X	
Natural Areas/Primitive Areas	X	X	-	X	-			X	X	X	
Outdoor Recreation Use	-	-	-	-	-			X	X	X	

ENVIRONMENTAL IMPACT ANALYSIS

1. Description of the proposal

2. Stages in proposal (optional)

3. Agents that cause change

4. Environmental Components

5. Subcomponents Impacted	6. Anticipated Impacts										

ENVIRONMENTAL IMPACT ANALYSIS

1. Description of the proposal

2. Stages in proposal (optional)

3. Agents that cause change

4. Environmental Components

5. Subcomponents Impacted	6. Anticipated Impacts										

ENVIRONMENTAL IMPACT ANALYSIS

1. Description of the proposal

2. Stages in proposal (optional)

3. Agents that cause change

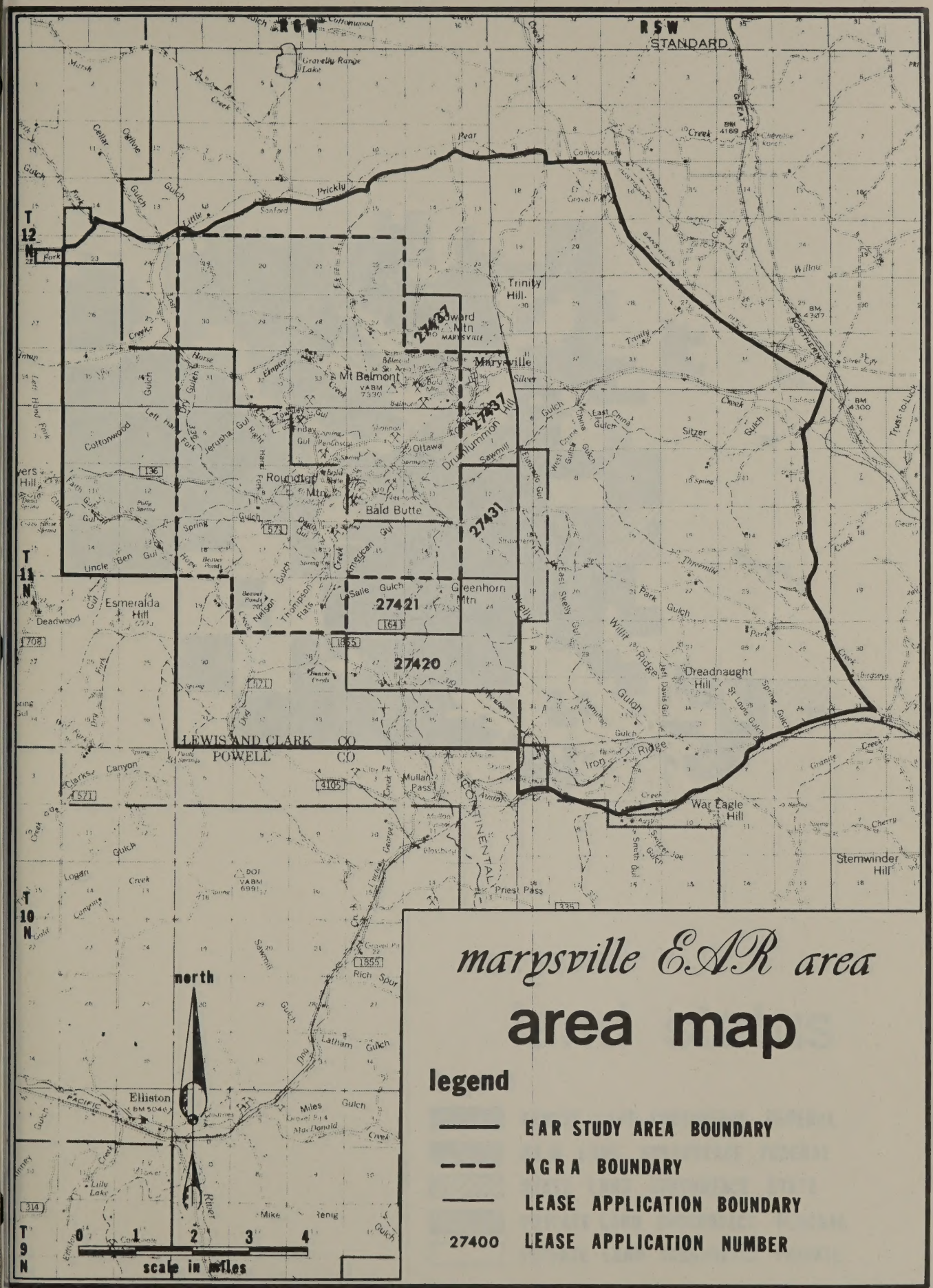
4. Environmental Components

5. Subcomponents Impacted	6. Anticipated Impacts										

APPENDIX TO SECTION 3

ILLUSTRATIONS

APPENDIX 3, FIGURE 1



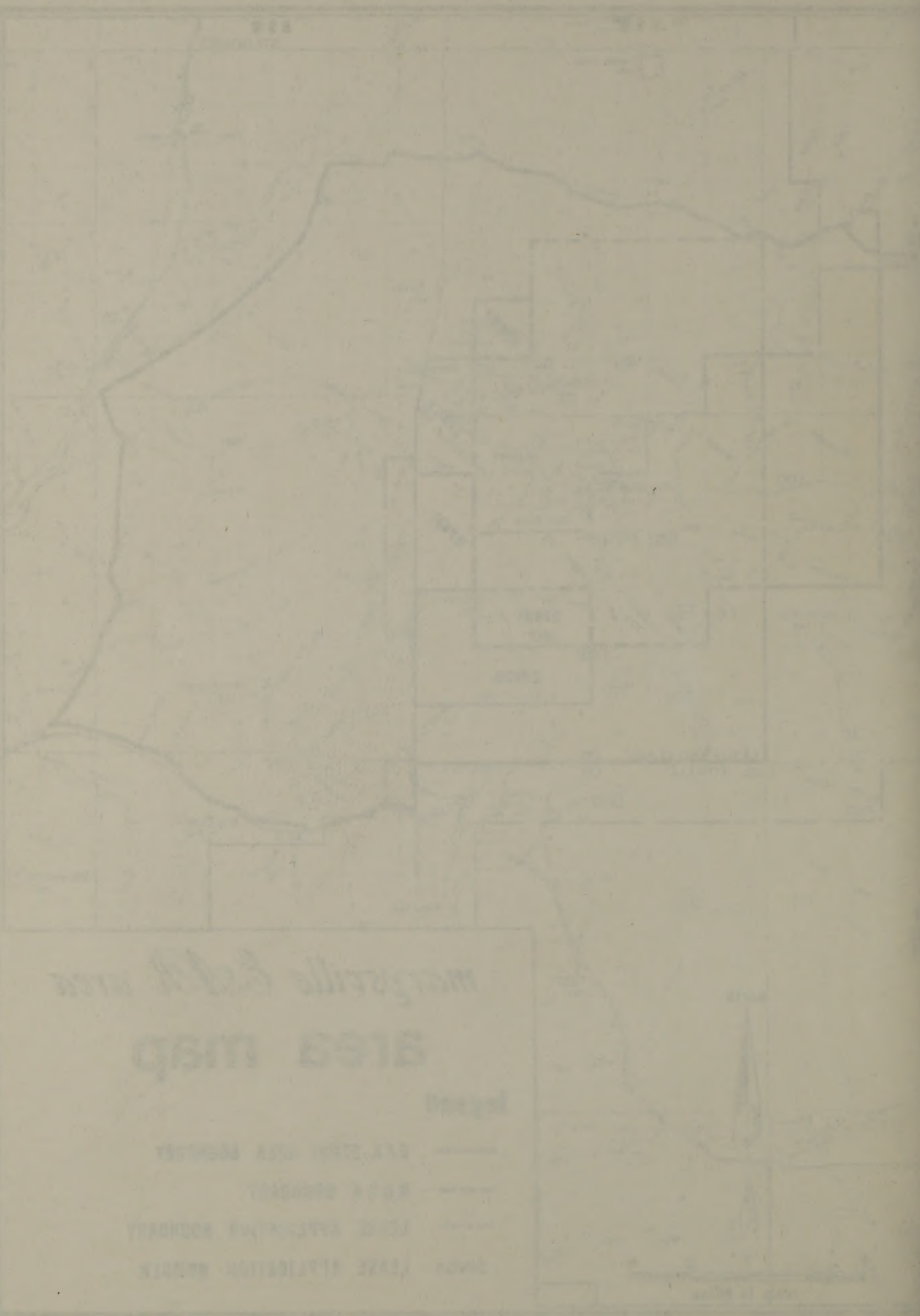
marysville EAR area

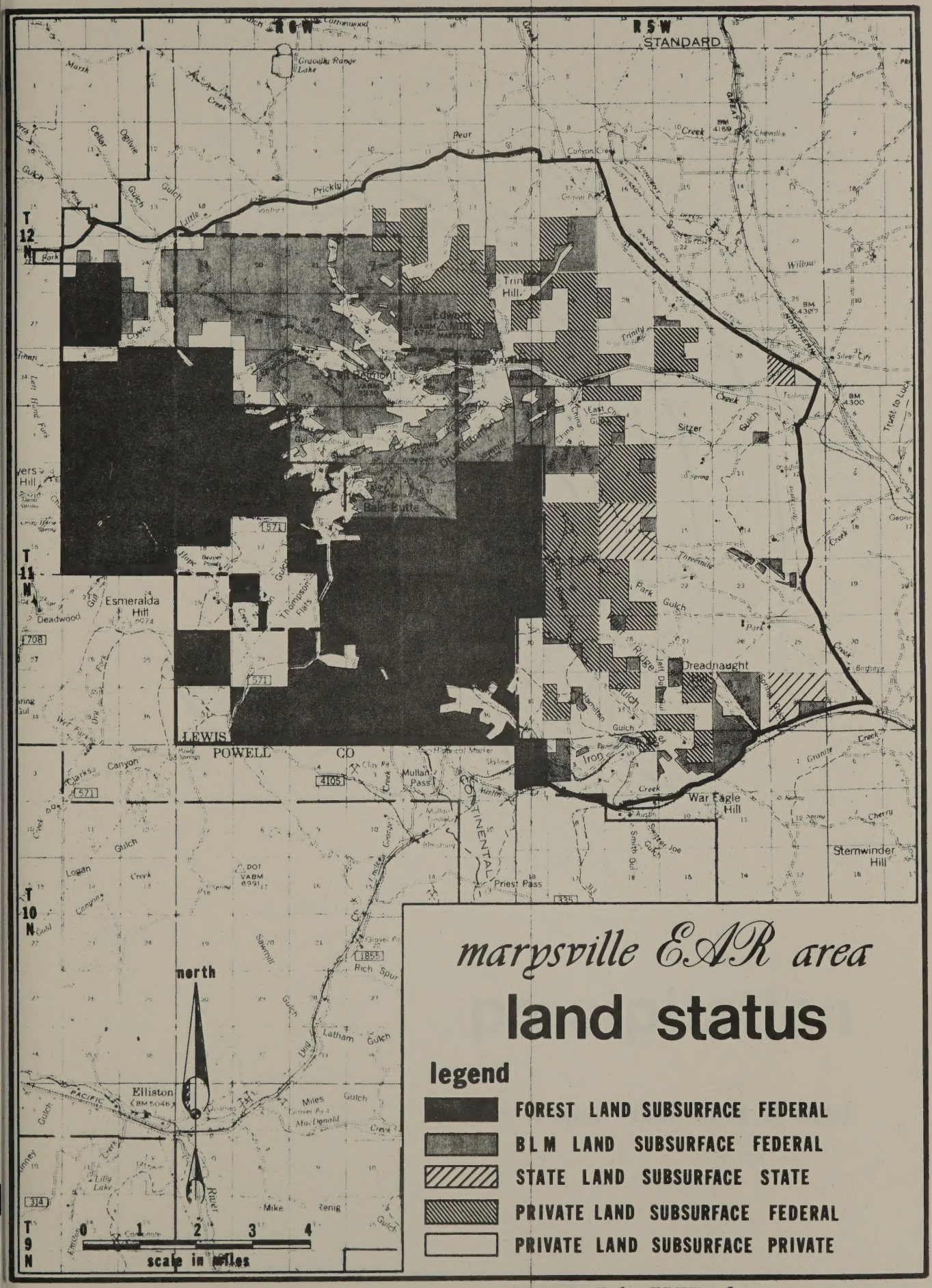
area map

legend

- EAR STUDY AREA BOUNDARY
- KGRA BOUNDARY
- LEASE APPLICATION BOUNDARY
- 27400 LEASE APPLICATION NUMBER

APPENDIX 3, FIGURE 1





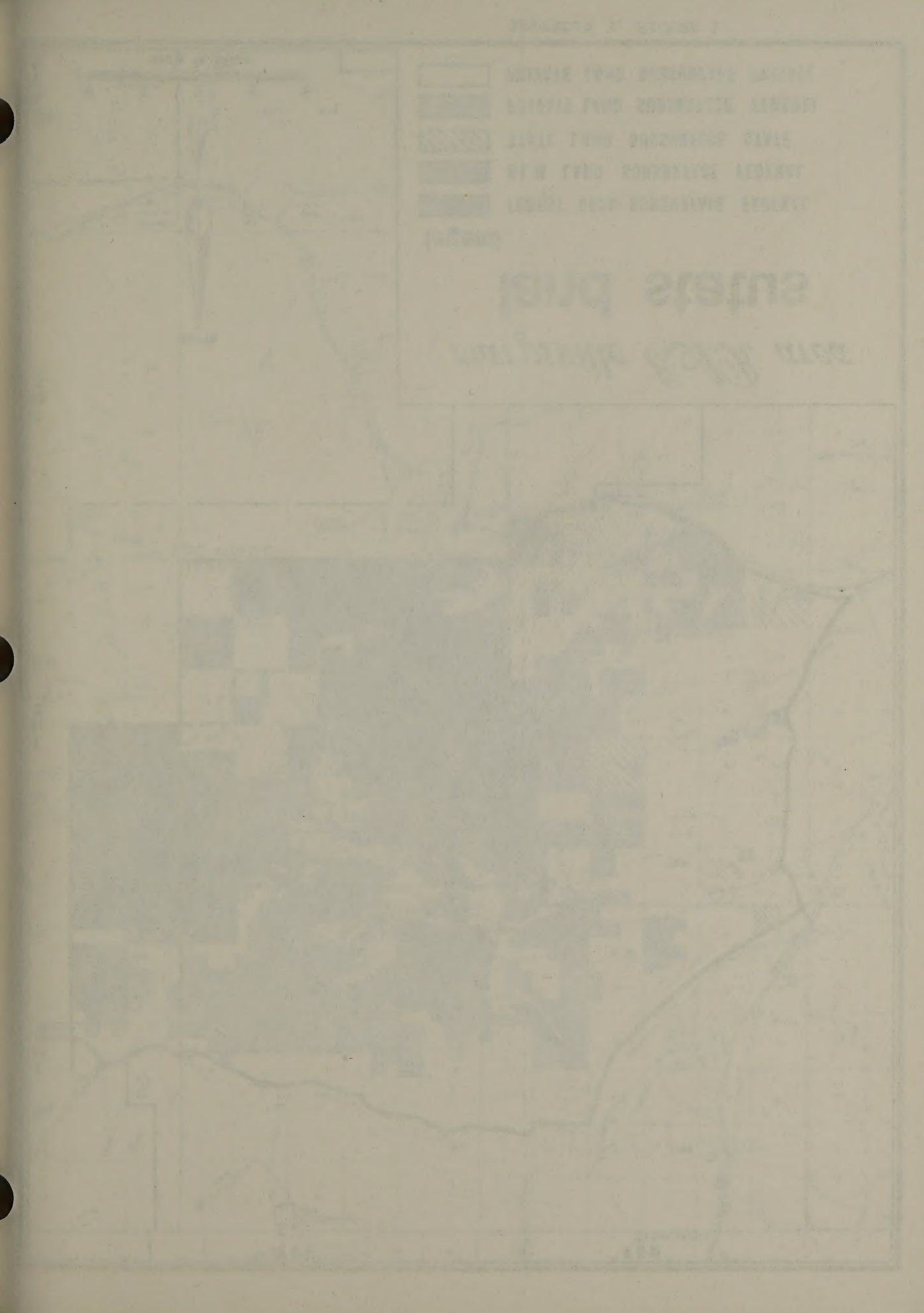
marysville EAR area

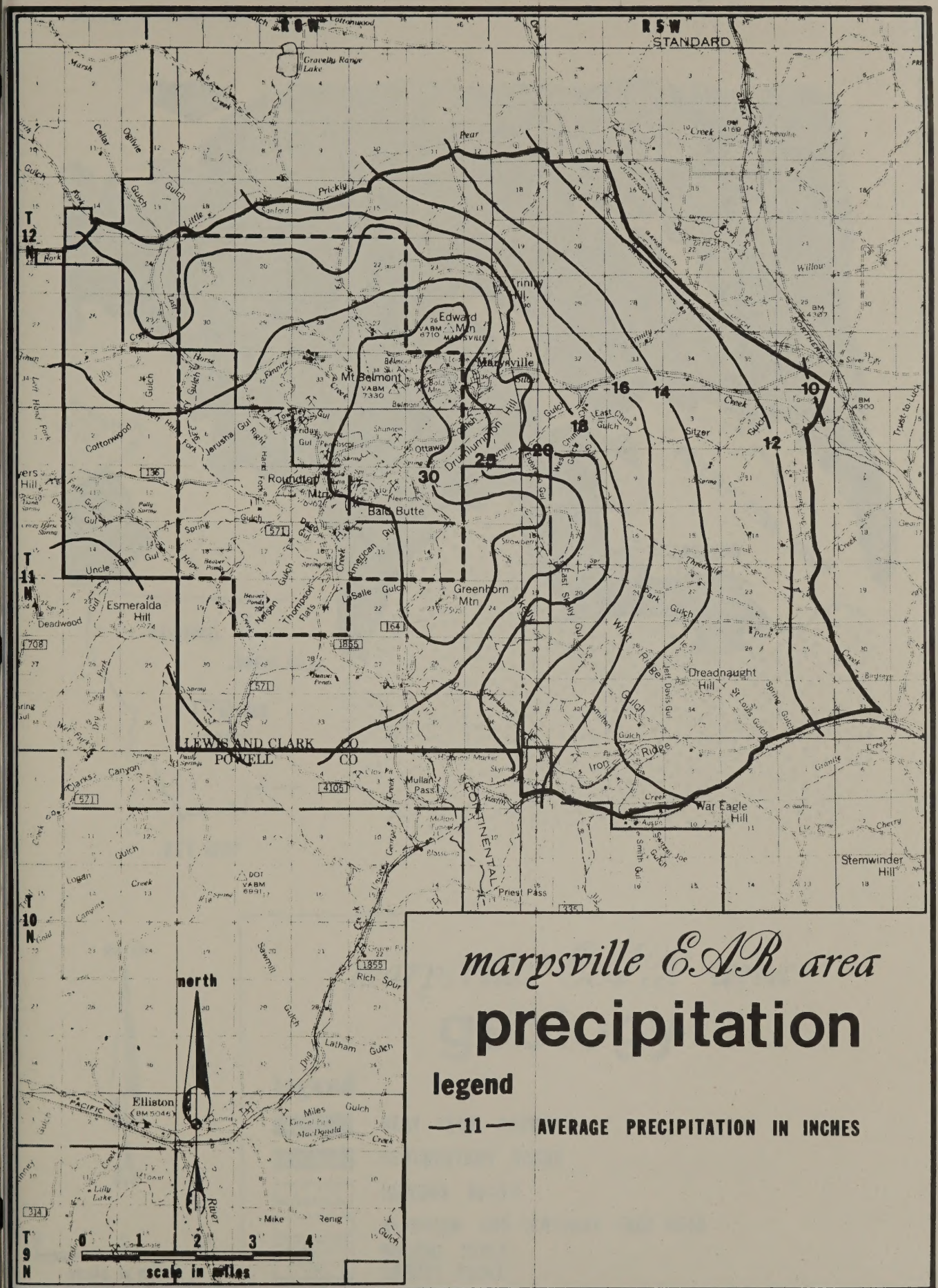
land status

legend

- FOREST LAND SUBSURFACE FEDERAL
- BLM LAND SUBSURFACE FEDERAL
- STATE LAND SUBSURFACE STATE
- PRIVATE LAND SUBSURFACE FEDERAL
- PRIVATE LAND SUBSURFACE PRIVATE

APPENDIX 3, FIGURE 1





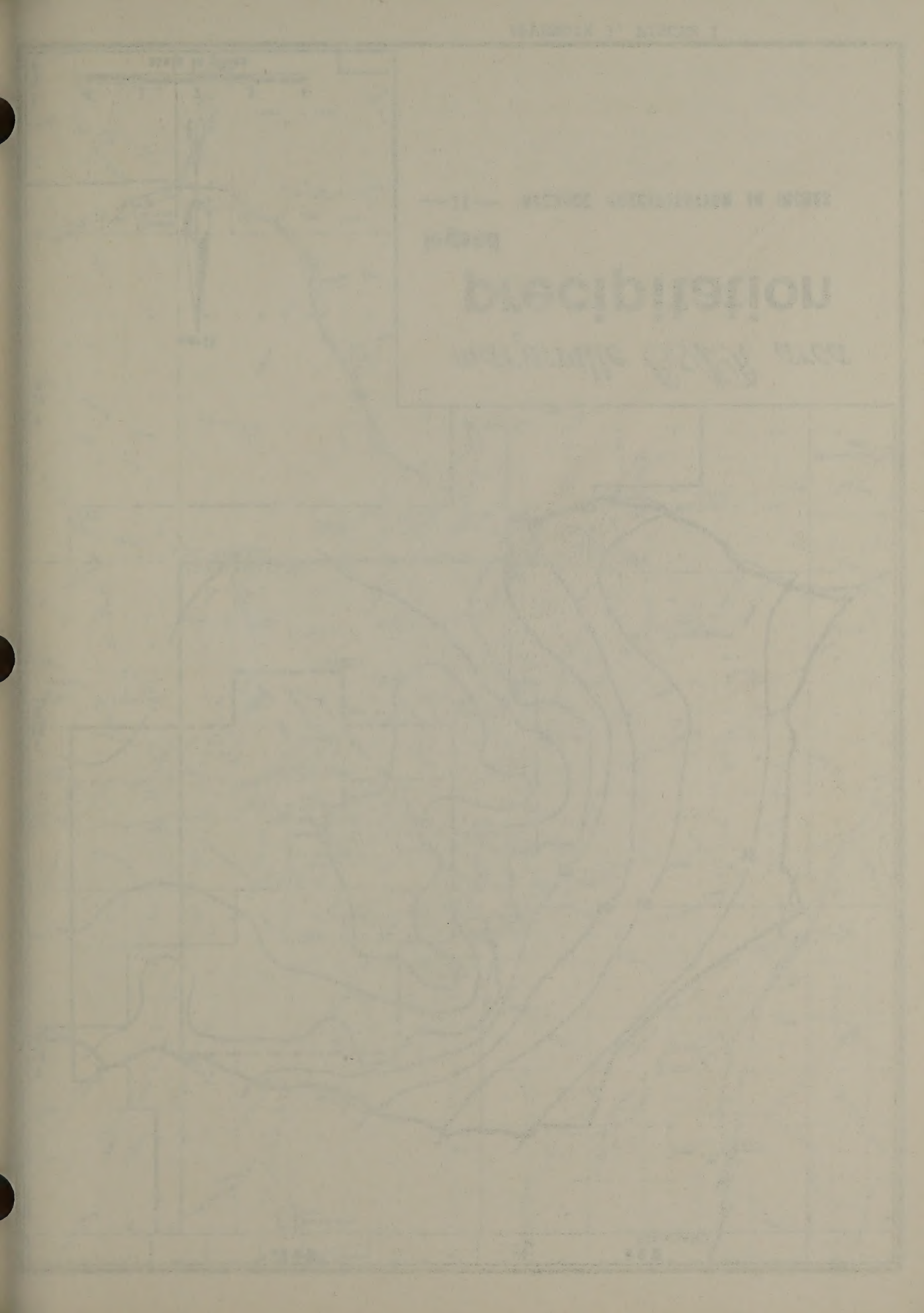
marysville EAR area

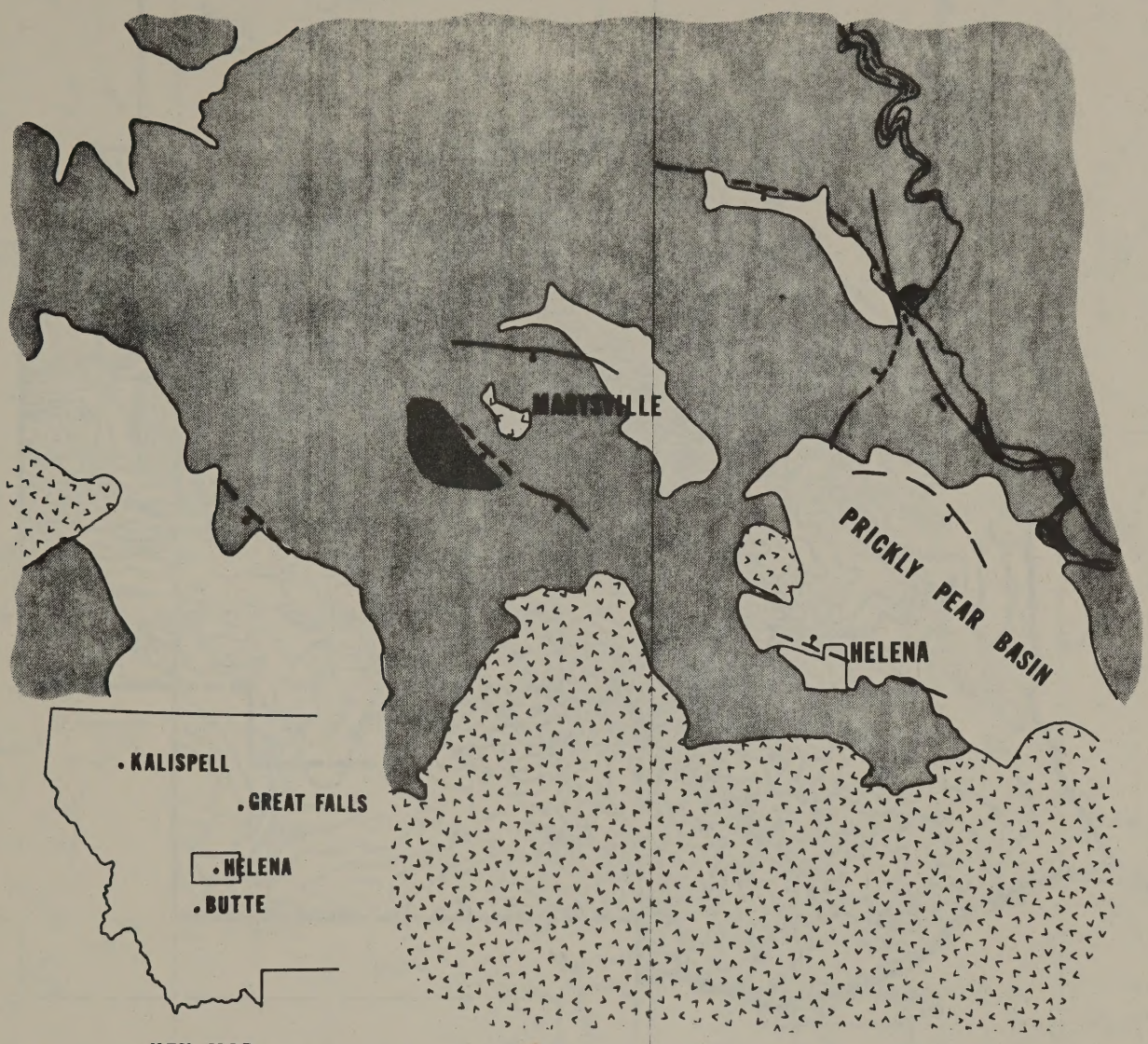
precipitation

legend

—11— AVERAGE PRECIPITATION IN INCHES

APPENDIX 3, FIGURE 1





north

0 5 10

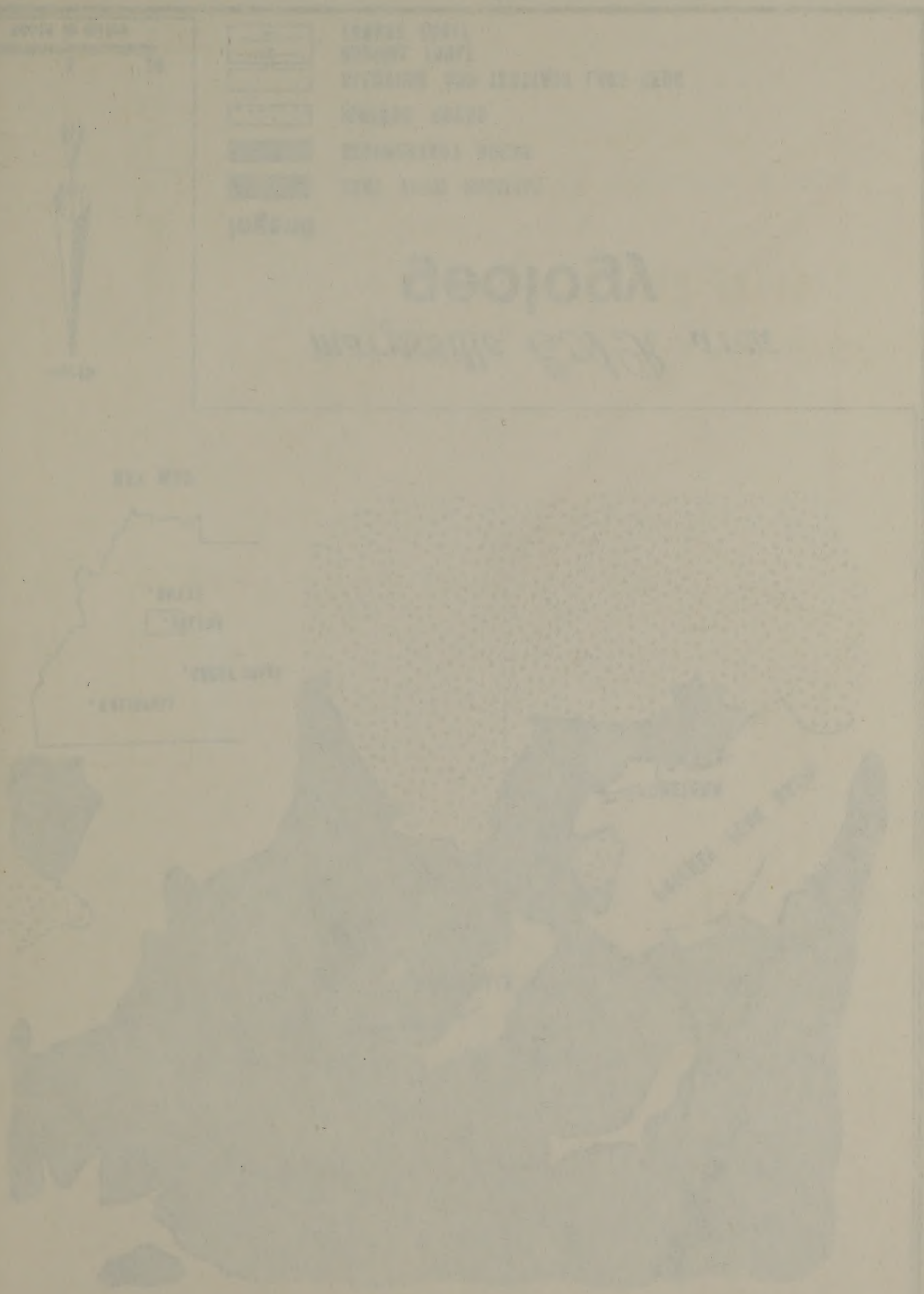
scale in miles

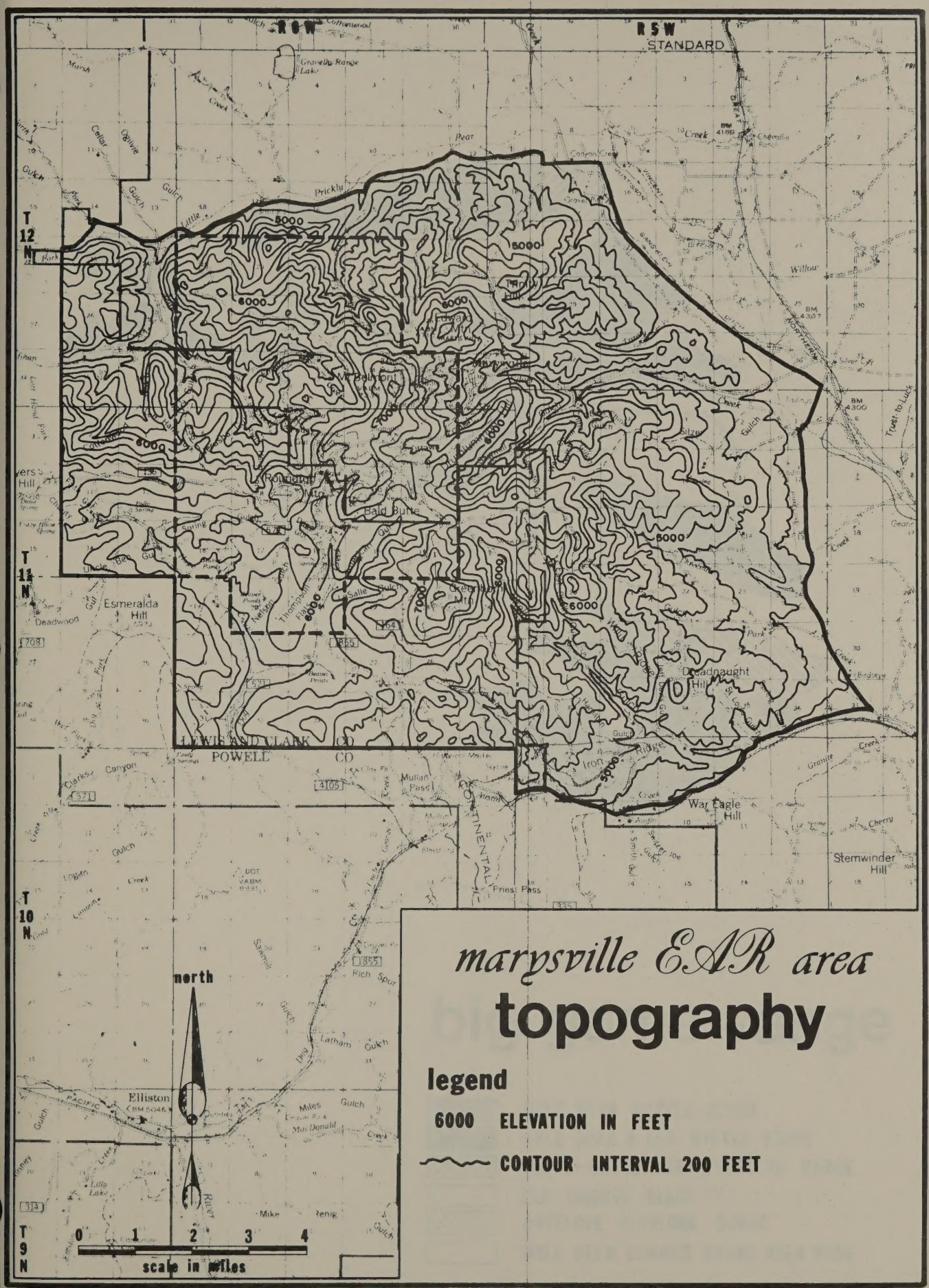
marysville EAR area
geology

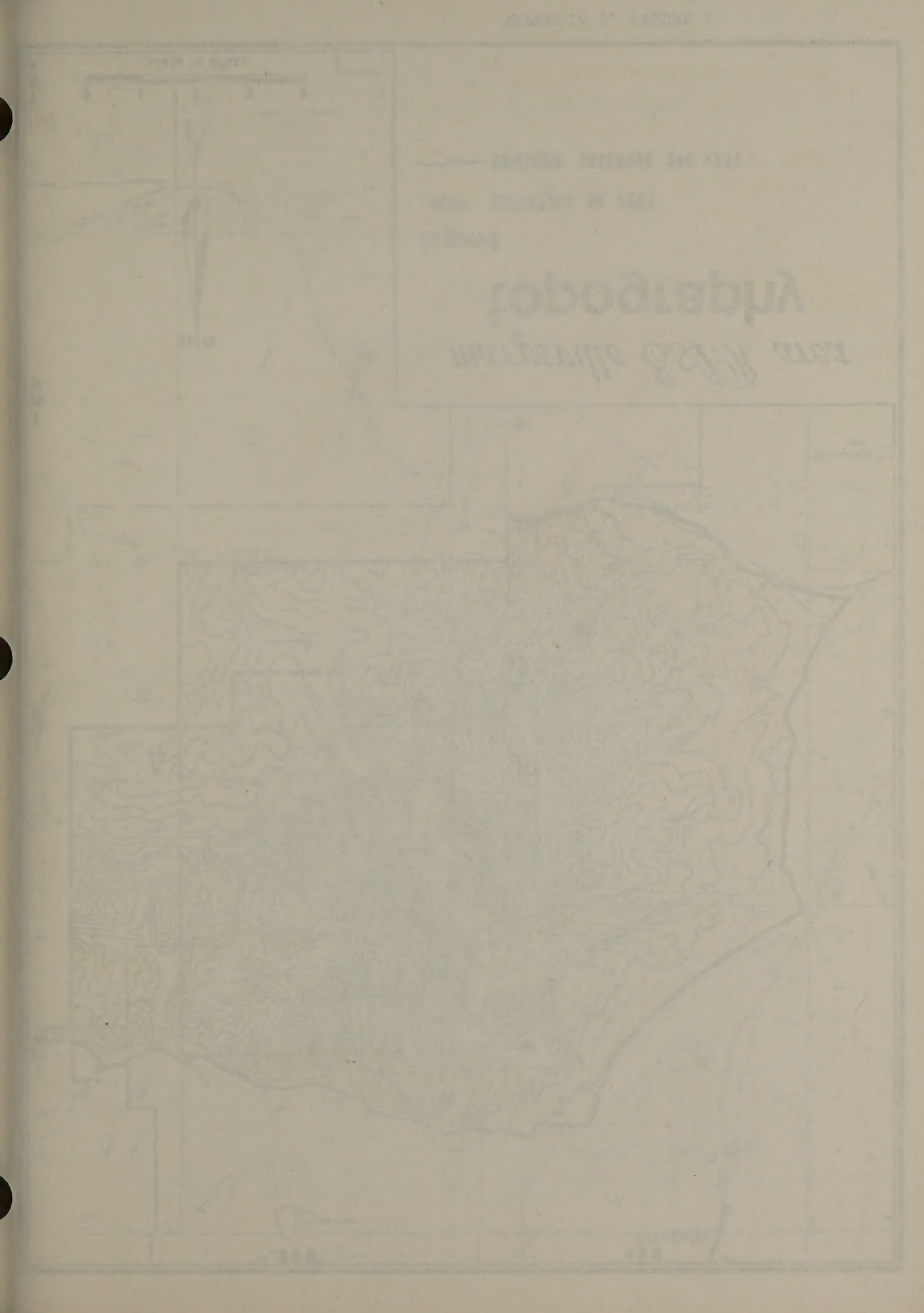
legend

- HEAT FLOW ANOMALY
- SEDIMENTARY ROCKS
- IGNEOUS ROCKS
- ALLUVIUM AND TERTIARY LAKE BEDS
- NORMAL FAULT
- THRUST FAULT

APPENDIX 3, FIGURE 1




R6W
R5W
STANDARD
T 12 N
T 11 N
T 10 N
T 9 N
6000
Gravelly Range Lake
Prickly Pear Creek
Cellar Gulch
Ogilvie Gulch
Little Gulch
Park
Willow Creek
Northern Pacific
Trust to Luck
Silver City
Bald Butte
Roundtop Mtn
Esmeralda Hill
Deadwood
Thompson Park
Twelve Mile
Dry Gulch
Deadwood Creek
Deadwood Gulch
Deadwood Ridge
Deadwood Hill
Deadwood Park
Deadwood Pond
Deadwood Spring
Deadwood Trail
Deadwood Canyon
Deadwood Fork
Deadwood Pass
Deadwood Mtn



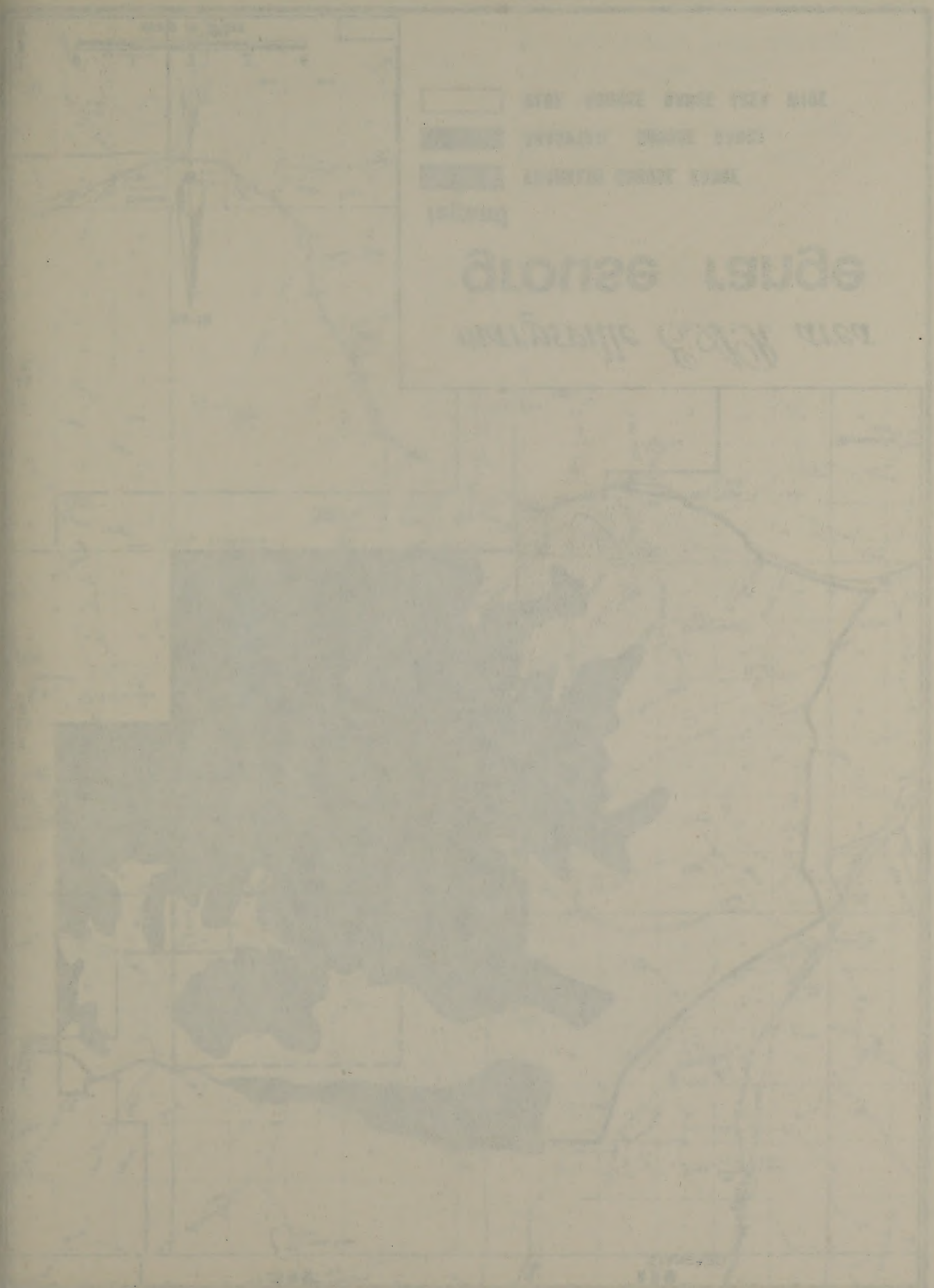
marysville EAR area

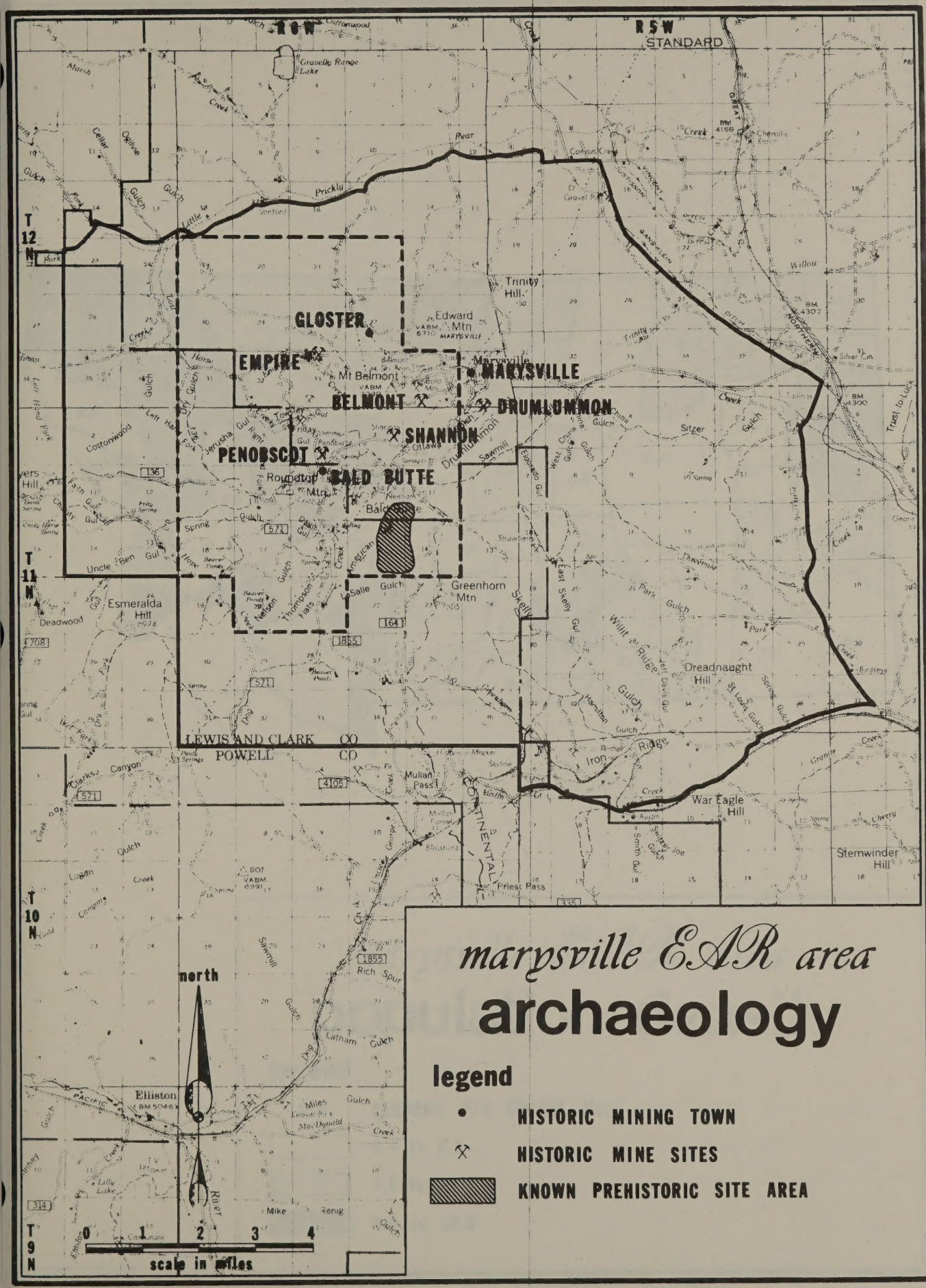
big game range

legend

- MULE DEER WINTER RANGE
- MULE DEER & ELK WINTER RANGE
- WHITE-TAILED DEER YEARLONG RANGE
- ELK SUMMER RANGE
- ANTELOPE YEARLONG RANGE
- MULE DEER SUMMER RANGE AREA WIDE

APPENDIX 3, FIGURE 1





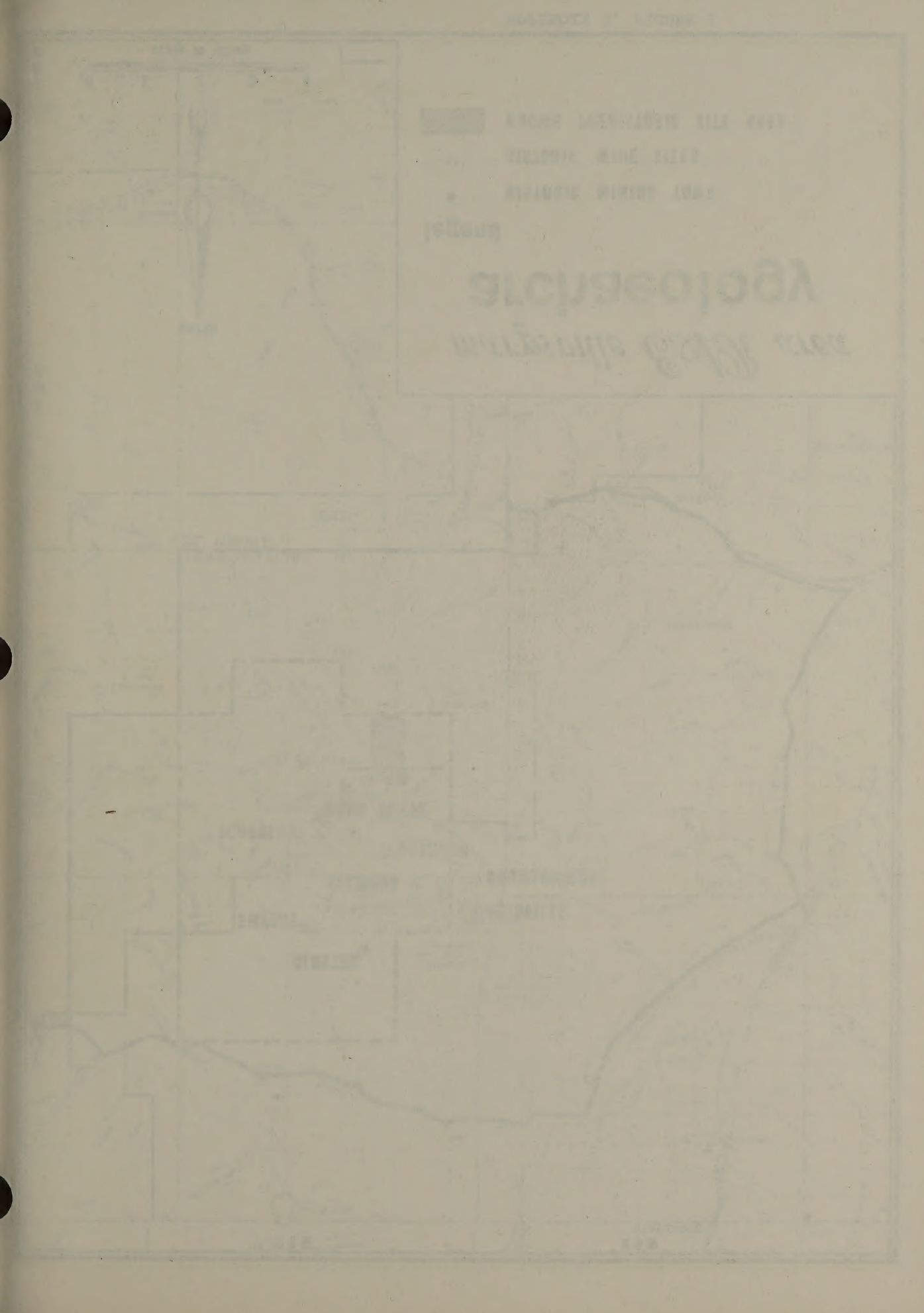
marysville EAR area

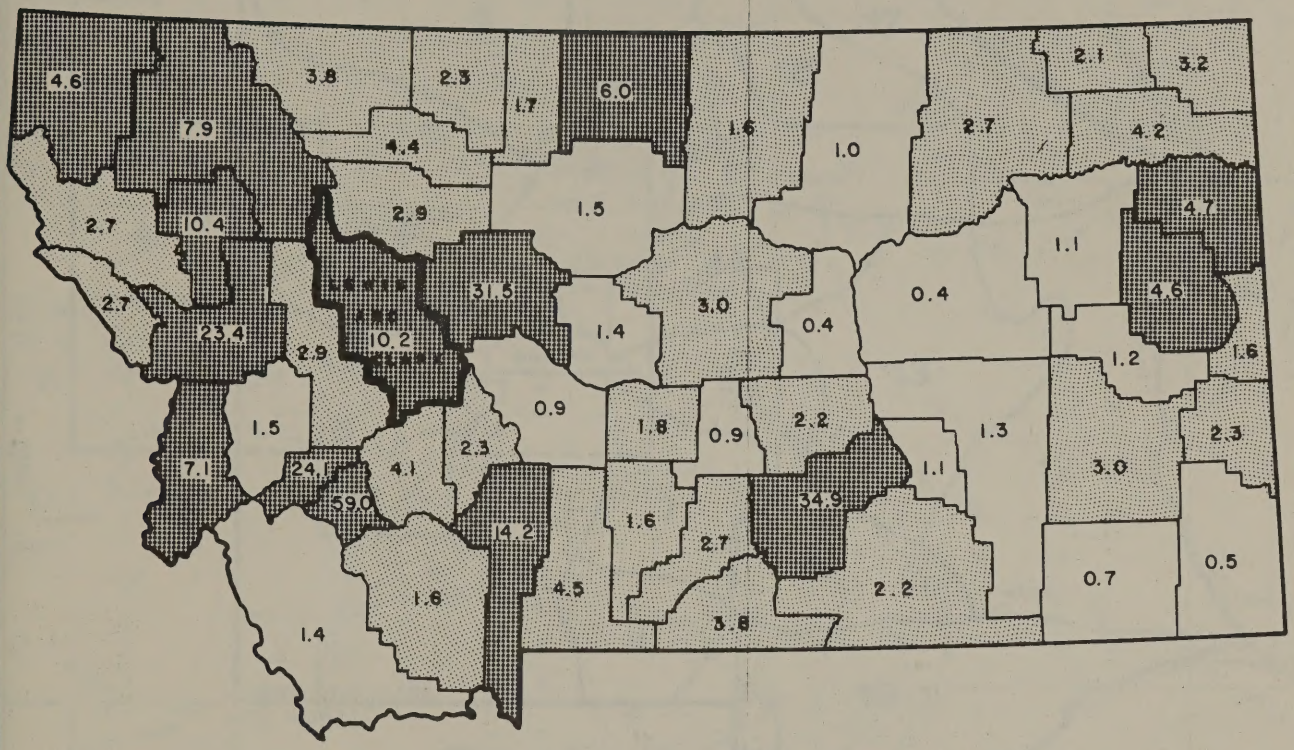
archaeology

legend

- • HISTORIC MINING TOWN
- ⚒ HISTORIC MINE SITES
- ▨ KNOWN PREHISTORIC SITE AREA

APPENDIX 3, FIGURE 1





marysville EAR area

population density

legend

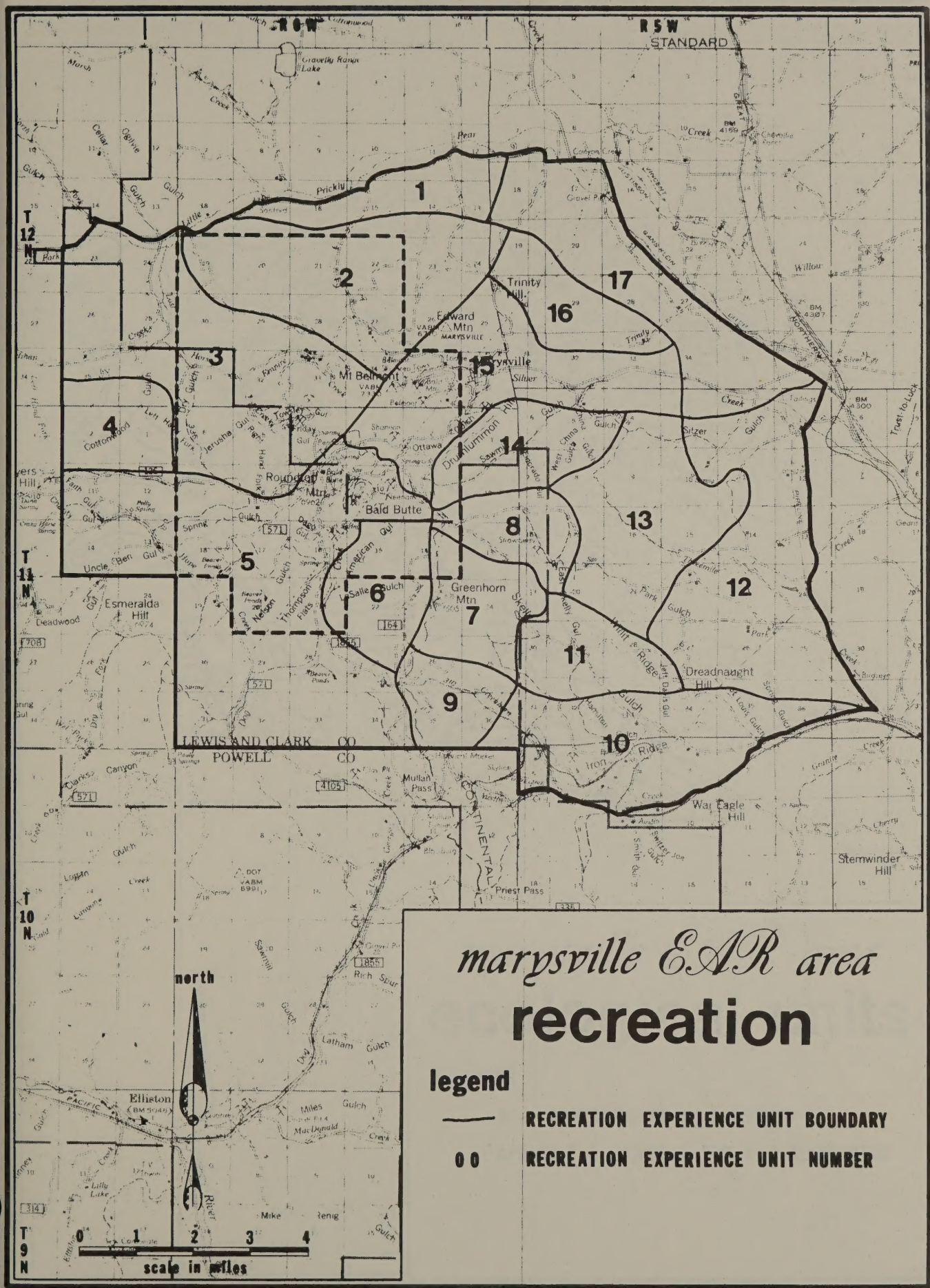
0.0 PERSONS PER SQUARE MILE

0.4 to 1.5

1.6 to 4.5

4.6 to 59.0

APPENDIX 3, FIGURE 1



marysville EAR area

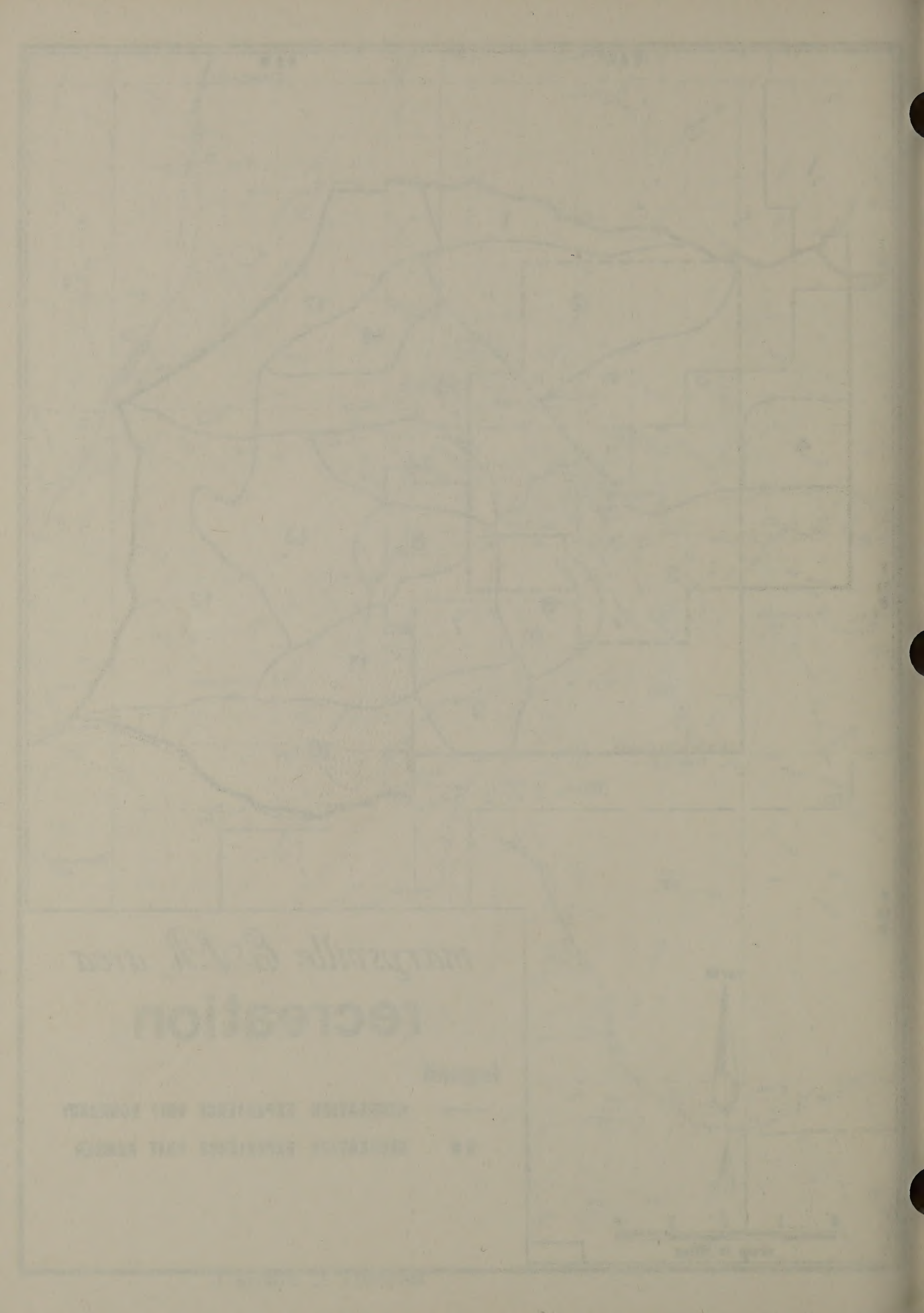
recreation

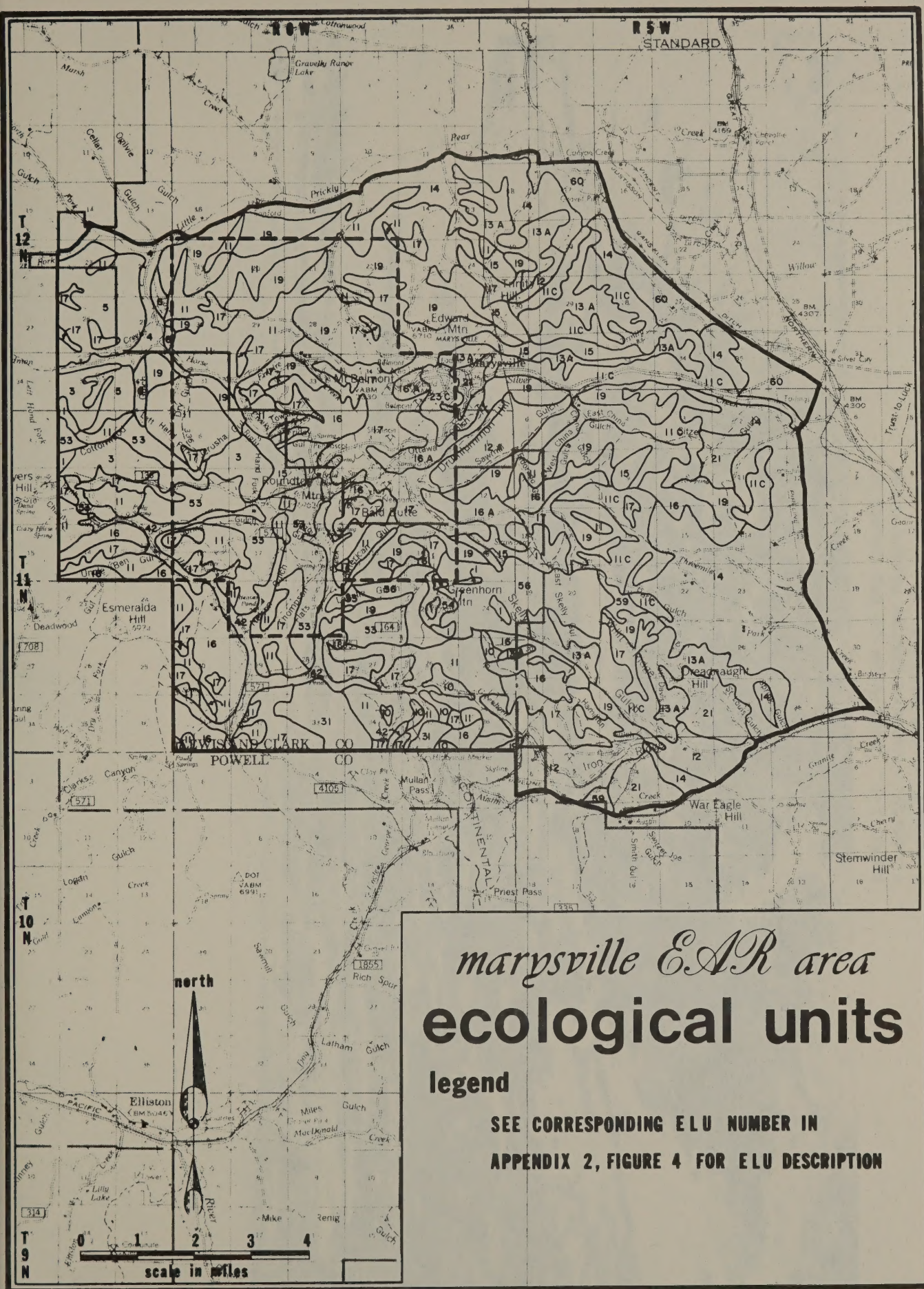
legend

— RECREATION EXPERIENCE UNIT BOUNDARY

00 RECREATION EXPERIENCE UNIT NUMBER

APPENDIX 3, FIGURE 1





marysville EAR area

ecological units

legend

SEE CORRESPONDING ELU NUMBER IN APPENDIX 2, FIGURE 4 FOR ELU DESCRIPTION

APPENDIX 3, FIGURE 1

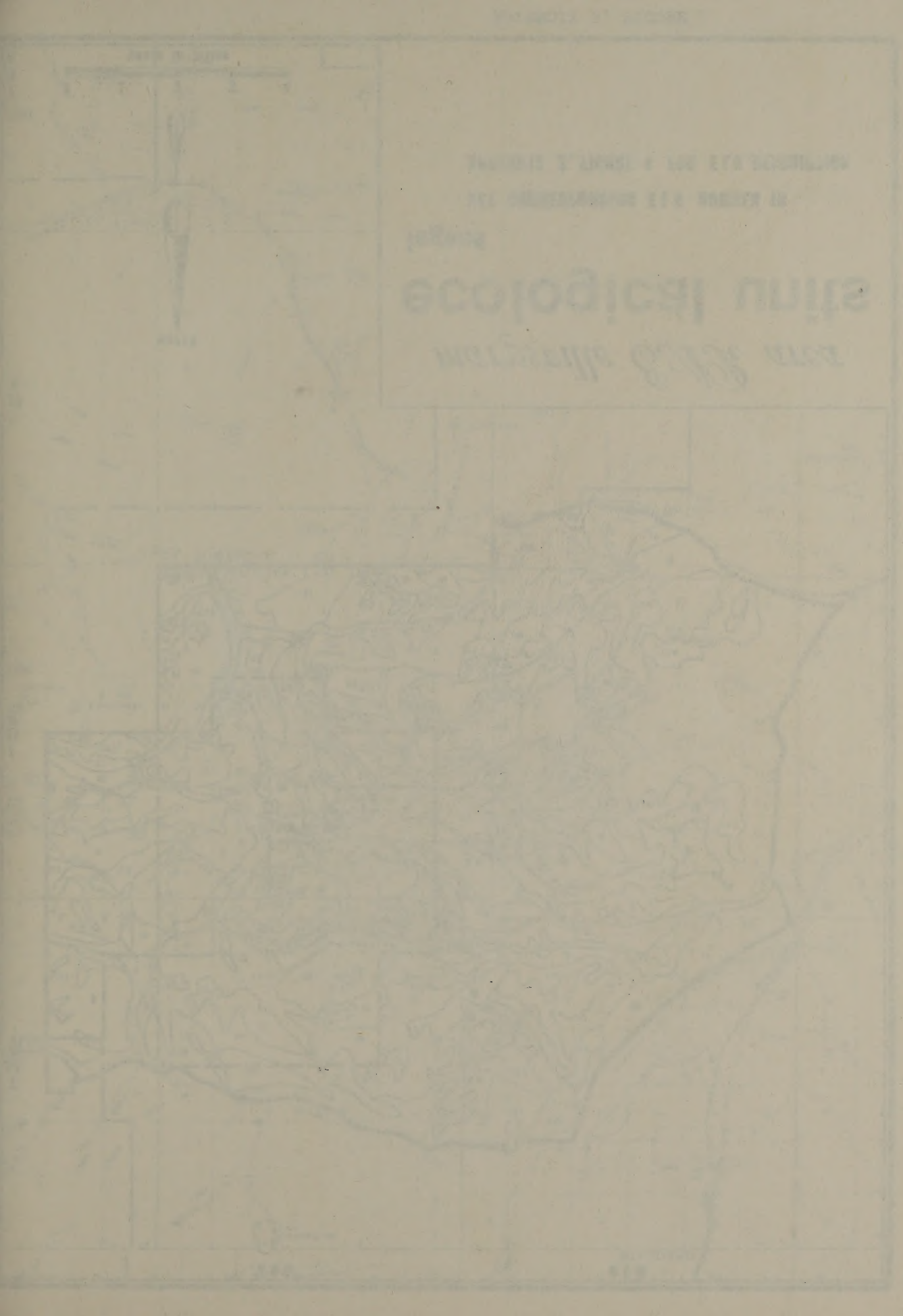
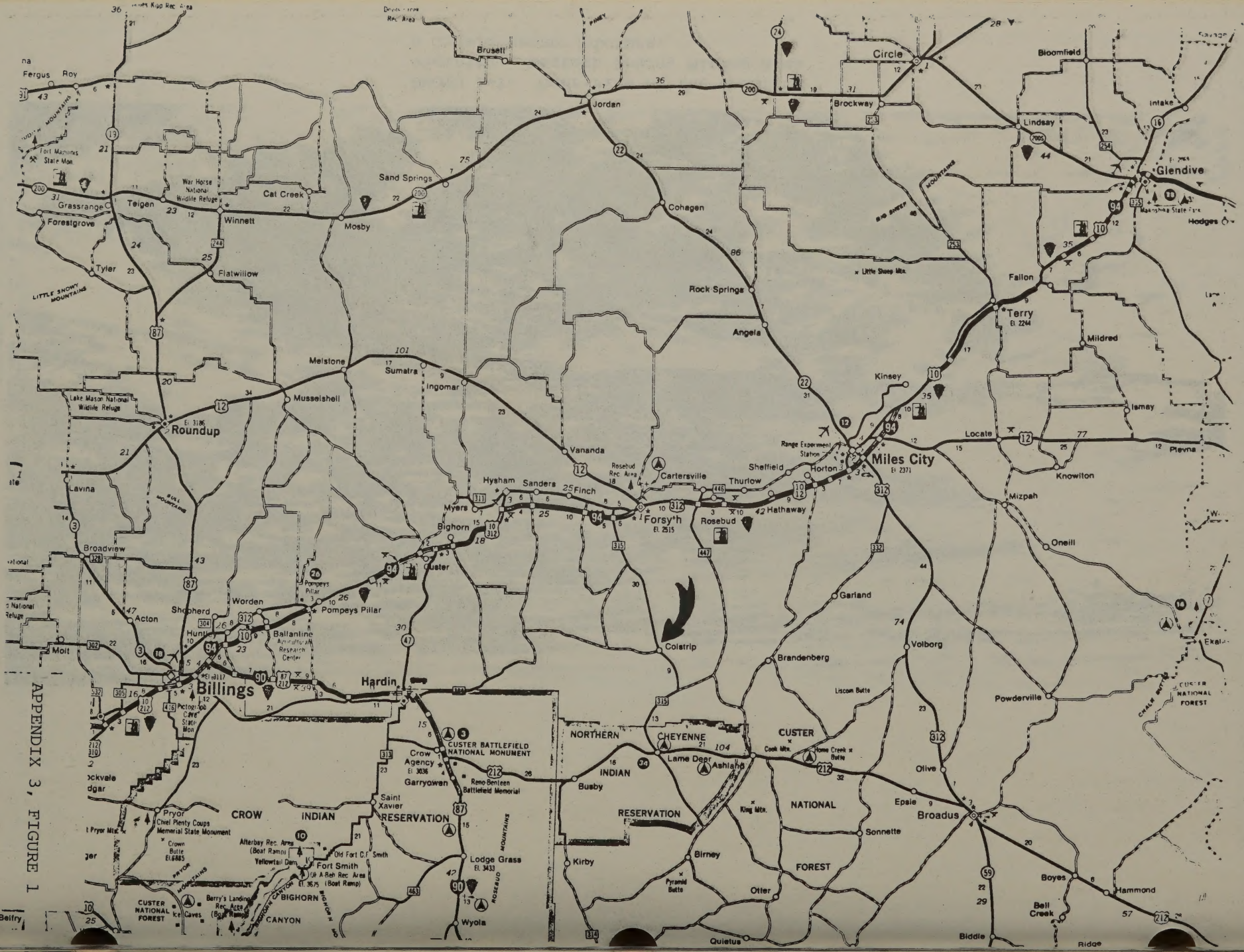


PHOTO 1-1. Over-view of the Colstrip vicinity. Western Energy Mining Area A in mid-center picture.

APPENDIX 3, FIGURE 1



APPENDIX 3, FIGURE 1

PHOTO 1-3. Western Energy Company's coal strip mining operations on Section 33 of mining Area A.

APPENDIX 3, FIGURE 1

PHOTO 1-2. Western Energy Mining Area A (dotted line) and the E½ of Section 32 (solid line) - Colstrip, MT.

Dissected Mid Slope-Xerophytic Forest ELU. Western Energy Mining Area A - Section 1. 02/17/76.

Dissected Mid Slope-Cropland (Fallow field aspect) ELU. Coal mine spoils in background. Western Energy Mining Area A - Section 4. 02/17/76.

Dissected Mid Slope-Cropland (Wheat field and fallow strip aspect in background) and Alluvium/Terrace-Cropland (alfalfa hay fields aspect in foreground) ELU's. Western Energy Mining Area A - Section 5. 02/17/76.

Alluvium/Terrace-Steppe Grassland ELU. Western Energy Mining Area A - Section 7. 02/17/76.

REVIEW COMMENTS

APPENDIX 3, FIGURE 2

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
ND Coordinator, Custer NF
Bismarck, ND 58501

LETTER #3

REPLY TO: 8420 Other Agencies Environmental Statements

January 6, 1976

SUBJECT: Falkirk Coal Lease Application

TO: ND State Planning Division
Capitol Building
Bismarck, ND 58505

Attention: Bonnie Austin

Thank you for allowing me to review the BLM Environmental Analysis of the proposed Falkirk Coal Lease Application #M-31053 (ND).

Although the U.S. Forest Service does not have any land which may be affected by the proposal, I would like to make a couple of comments which may be pertinent.

First, I think the report is excellent. It seems to cover the problem with alternatives very thoroughly.

3-1 I noted one piece of proposed lease land is within one-half mile of the town of Underwood and two other pieces are within two miles of town. Should the close proximity to town be a consideration in not leasing them? Perhaps they could be considered as areas to be kept in a natural condition.

3-2 The chart on BTU's indicated 6415 BTUs per pound of coal. How does this compare with other coal deposits in the area as far as BTU output. A comparison chart may be helpful.

3-3 A thought on temporary cover to prevent erosion while the land is still unreclaimed would be quick growing grain crops such as oats or flax.

3-4 The report mentioned that it might be well to irrigate the land immediately before disturbing to make it easier to lift the top soil. If this was done, would it be possible to lift the surface vegetation and store it temporarily such as is done by contractors who furnish sod for homes?

BERNARD W. ALT

BERNARD W. ALT
ND Coordinator

BLM Action - U.S. Forest Service Letter #3

Key No.

3-1 Falkirk Mining Company plans to mine the private coal which lies, between this parcel of federal coal (NW¼, Sec. 20, T. 146 N., R. 82 W.) and the town of Underwood. If this parcel were not leased it would only be isolated within the mine and would still not function as a "buffer" for the town of Underwood. This parcel is completely farmed at present, and therefore, not in a natural condition. Selective denial of specific tracts is a decision-maker's option during the final lease application disposition process. No action was taken on the analysis document.

3-2 Aside from purely academic interest, the analysis team felt a coal BTU comparision chart would not contribute significantly to the content of the analysis. No action was taken in the EAR.

3-3 No response necessary.

3-4 Most of the mine area is cultivated farmland, and as such, has no real "sod" structure. On a project of this scale and magnitude, sodding was not considered a realistic mitigating measure, although this procedure did "surface" during the analysis process. No action was taken on the EAR document.

LETTER #5

IN HUNTING & FISHING

NORTH DAKOTA GAME AND FISH DEPARTMENT

VARIETY

Miles City District
January 30, 1976
DM ... Asst DM ...
RPM ... Cpr ...
FEB 2 1976
Adm ... BGD ... Pwdr ...
Pr ... SD ... NDPO ...
Action ... File ...

Mr. Kannon Richards
District Manager
Miles City District
Bureau of Land Management
P.O. Box 940
Miles City, MT 59301

Dear Mr. Richards:

This Department has completed a review of your Falkirk Coal Lease Application M-31053 (ND) Environmental Analysis Record, and we would make the following limited comments concerning this report:

1. Page 3. C. Available Alternatives - We agree that all tracts should be included in this analysis. We do, however, consider the denial to lease certain tracts or portions of certain tracts as a viable alternative open to the Bureau of Land Management. Example - the NE¼NE¼ of Section 34-146-82 has 23.6 acres of Zahl-Max loams, 9-35% slope. A natural brushland draw (waterway) runs this portion of the NE¼NE¼ of 34. We would consider this portion of the tract to be very difficult, if not impossible, to properly reclaim due to soil, slope and the waterway. We would consider it justifiable for BLM to lease just the northwest portion of this tract containing soils mapped as 63 and 63B (soils appendix).

5-1

The same consideration would apply to the NE¼NW¼ of Section 24-146-82 containing Zahl-Max loams, 9-35% slope and brushland draws (waterways). Mining could be done parallel to these steep waterways and then reshaped to conform to the edge of the draw(s). We presently know of no way to properly reclaim these steep shaped waterways or draws to "equal or better" than original condition. Water quality in the area would be badly degraded if these steep waterways are mined on either federal or private coal leases. Significant waterways should be protected to allow the cover in these waterways to act as filter traps for mined area runoff.

RUSSELL W. STUART
COMMISSIONER

WILBUR BOLDT
DEPUTY COMMISSIONER

H. H. SPITZER, CHIEF, ENFORCEMENT DIVISION
DALE HENEGAR, CHIEF, FISHERIES DIVISION
C. R. GRONDAHL, LEADER, GAME INVESTIGATIONS
R. L. MORGAN, LEADER, HABITAT DEVELOPMENT
PERSHING CARLSON, CHIEF, PUBLIC RELATIONS DIVISION

2. Page 74. 00. - Block planting acreage is listed as 2 to 5 acres. Normally, winter cover block tree plantings are usually 4 to 10 acres in size. Odd area woody plantings should be added to the list of woody plantings in this paragraph. 5-2

3. General - BLM should request that surface habitat be restored to its original condition. Native grasslands, woody habitat and wetlands should be compensated for in reclamation planning and plans. Compensation for wetlands should be worked out with the Fish and Wildlife Service (State office). Native woodland habitat should be replaced on a 2 for 1 basis. Native grasslands should be restored by seeding like acreages to native grass seed mixtures. 5-3

Sincerely,

Robert L. Morgan
Chief: Lands & Development Division

RLM:hk

BLM Action - North Dakota State Game and Fish Department Letter #5

Key No.

5-1 Lease denial on some tracts of this application may be environmentally justified. The summary-conclusion portion of the analysis (see page 86) was modified to reflect this situation. Selective denial of lease tracts is a managerial decision option that must be considered in the ultimate evaluation of a lease application. The environmental analysis record (EAR) is a guidance document (aid to a manger), not a decision document in itself. Therefore, specific lease action decisions are not appropriate in the context of the EAR.

5-2 This mitigating measure was modified to reflect the corrected acreages and planting options (see page 74).

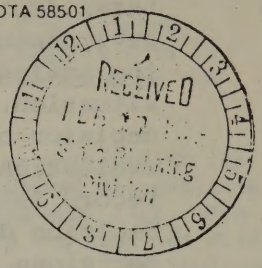
5-3 These mitigating measures are presented on pages 73, 74, 77 and 78.

LETTER #9

MEMORANDUM

NORTH DAKOTA STATE PLANNING DIVISION

STATE CAPITOL—FOURTH FLOOR—BISMARCK, NORTH DAKOTA 58501
701 224-2818



DATE: February 11, 1976

TO: Bonnie

FROM: Austin

RE: BLM Environmental Draft Analysis of Falkirk Coal Lease Application

Bonnie:

In looking over the above named document, I would make the following comments for possible inclusion in the final draft of the environmental analysis.

9-1 1) Strong measures should be included in the lease stipulation to prevent the mixing of top soil with sub-soil. Measures to accomplish such prevention are discussed in points T, U and V on page 71.

9-2 2) The final lease stipulations should include not only the technology to prevent mixing of top soil and sub-soil but also on-site monitoring to make sure maching operators are following the technology.

9-3 3) Research being carried out by the Mined Land Planning Group and funded with OWRC funds includes the following task: "Determination of the influence of sub-surface geologic materials on rehabilitation potential and of the effects of surface mining on shallow ground water supplies". Mr. Jerry Groenewald of UND (phone: 777-2231) has directed the work on this task. He should be consulted regarding ground water problems.

4) Mr. Groenewald has also been concerned with drag line techniques as they affect the problems of shifting, piping and slumping spoils even after they have been reshaped. He should be consulted on these problems.

SIGNED:

/ds

Austin Engel, Director

BLM Action - North Dakota State Planning Division Letter #9

Key No.

9-1 No action necessary.

9-2 On-site soils monitoring was added as a mitigating measure on pages 72 and 77 of the analysis document. Some technically feasible procedures to prevent top and sub soil mixing are discussed in the mitigating measures sections of the document.

9-3 Mr. Groenewold was contacted in regard to the subject studies. He stated that some of the reports resulting from these studies should be available by summer, 1976. This information should help fill some of the existing "data-gaps" and knowledge deficiencies.

BLM LIBRARY
RS 150A BLDG. 50
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, CO 80225

Form 1279-3
(June 1984)

BORROWER'S CARD

HC 107 .M9 M668 1976
U. S. Bureau of Land
Management. Montana State
Montana environmental
analysis handbook

DATE LOANED	BORROWER	OFFICE	DATE RETURNED

(Continued on reverse)

USDI – BLM

HC 107 .M9 M668 1976
U. S. Bureau of Land
Management. Montana State
Montana environmental
analysis handbook

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